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USSR Report

LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

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Kiev DOGLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 9, Sep 85 (manuscript received 28 Mar 85) pp 73-75

MUSIYENKO, N. N., DASKALYUK, T. M. and KAPLYA, A. V., Kiev State University iemni T. G. Shevchenko

[Abstract] A comparative study was performed of the thermal injury of three-day-old etiolated and green Odessa 51 wheat sprouts under the influence of excessive temperature. Seeds were wet at 4°C for 12 hours, treated with a solution of potassium permanganate, carefully washed in distilled water and placed on filter paper in petri dishes. Green sprouts were exposed to thermal stress during the middle of the 16 hour daylight period together with the etiolated sprouts in an air thermostat at 50°C. Etiolated sprouts were found to be more resistant to thermal stress than green sprouts of the same age, indicating that etiolation in early stages is a nonspecific defense factor increasing the heat resistance of plants. Figures 3; references 8:5 Russian, 3 Western.
[084-6508/12223]

UDC: 575.24:584.524.1

GENETIC ACTIVITY OF EXOMETABOLYTES OF HIGHER PLANTS, AND SOIL MICROORGANISMS IN CONNECTION WITH ALLELOPATHY

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 85 (manuscript received 14 Jan 85) pp 63-66

GRODZINSKIY, A. M., academician, UkSSR Academy of Sciences, KVASHA, V. V., KOSTROMA, Ye. Yu. and GOLOVKO, E. A., Central Republic Botanical Garden, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] The exometabolites of higher plants are substances formed in the breakdown of plant residues and are also products of soil microorganism living activity. The substances are important in allelopathic soil exhaustion, being liberated intensively by microscopic fungi and certain types of bacteria. It has been suggested that physiologically active substances take part in genetic processes, particularly mechanisms of regulation of genetic activity. However, the existence of this mechanism requires confirmation by experimental data. The purpose of this work was to study the genetic activity of certain compounds in the allelopathic complex. Microbe test systems were used as models with various levels of organization. Twenty compounds, metabolites of plants and microorganisms, as well as extracellular excretions of soil fungi of genera Aspergillus and Penicillum, were tested. Some substances, including benzoic and parahydroxybenzoic acids, coumarin, ferulic and coumaric acids, benzaldehyde and resorcinol, were found to inhibit the growth of saccharomycetes. Substances of microbial origin, fusaric and picolinic acids, had significant genetic activity, causing reserve mutations in salmonella strains defective in histidine synthesis genes. Extracellular excretions of certain soil fungi also had significant genetic activity. Increasing variability as a result of this genetic activity expands the capabilities for natural selection which takes on a vector nature with a certain background. References 14: 12 Russian, 2 Western.
[070-6508/12223]

UDC: 595.429.2:591.132

INFLUENCE OF TEMPERATURE OF MEDIUM ON ACTIVITY OF DIGESTIVE ENZYMES OF PHYTOSEIULUS PERSIMILIS AND AMBLYSEIUS LONGISPINOSUS MITES

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 85 (manuscript received 14 Jan 85) pp 61-63

BARABANOVA, V. V., Institute of Zoology, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] The author studied the influence of temperatures from 20 to 80°C, at 10°C intervals, on the amylolytic, invertase and proteolytic activity of the mites phytoseiulus persimilis and amblyseius longispinosus, now utilized or beginning to be utilized in the biological method of protection of plants from spider mites. The comparison of the effect of various temperatures on the amylolytic activity of Ph. persimilis and A. longispinosus showed that the temperature optimum of activity of the enzyme in Ph. persimilis was 45°C, in A. longispinosus--50°C. Maximum invertase activity appeared in Ph. persimilis upon incubation at 50°C, in A. longispinosus--at 60°C. Preliminary holding of homogenates of both species at 40-50°C resulted in depression of the hydrolytic activity of invertase. The optimum of proteolytic activity of both species was 40°C. Figures 1; references 3 (Russian).
[070-6508/12223]

UDC 569.8:591.477-18:591.58

CHEMICAL COMMUNICATION AMONG PRIMATES

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 99, No 2, Mar-Apr 85 pp 277-291

SOKOLOV, V. Ye., CHERNOVA, O. F. and DERYAGINA, M. A. Institute of Evolutionary Morphology and Ecology of Animals imeni A. N. Severtsov, USSR Academy of Sciences, Moscow; Bological Faculty of Moscow State University imeni M. V. Lomonosov

[Abstract] Chemical communication among primates has been poorly studied in comparison to visual and acoustic recognitions. Smelling and spraying is considered to be a lower evolutionary method of recognition common to only some of the primates. In this paper, evolutionary tendency toward development of chemocommunication is reviewed along with determination of its use in various primate taxons. The review covers the following two general subtopics: signalling role of skin gland secretions and evolutionary aspects of olfactory behavior in primates. Olfactory signals are often combined with more advanced visual and tactile signals, permitting more refined and individualized communication expressions among the primates. Figure 1; references 88: 8 Russian, 80 Western. [1006-7813/12223]

UDC 636.22/ .28.083:612.799

SEASONAL VARIATIONS IN CATTLE HAIRY COAT IN RELATION TO UPKEEP CONDITIONS

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 9, Sep 85
(manuscript received 20 Jun 84) pp 88-91

SHALIMOV, V. V. and RESHETOV, A. I., Uzbek Scientific Research Institute of Animal Husbandry, Krasnyy Vodopad, Tashkent Oblast

[Abstract] Several cattle breeds and cattle-zebu hybrids were studied for the condition of the hairy coat in relation to climatic conditions in Uzbekistan and upkeep of the animals. Determinations were conducted on the coat density, length of hair, hair angle and weight (mg/cm^2) of Latvian brown cattle, black spotted cattle, Bushuyevskaya cattle and black spotted-zebu hybrids. The condition of the hair coat was found to be an important adaptational characteristic. Animals maintained free on the pasture lands in winter had a denser and a more protective hair coat than animals kept in barns. Loss of hair of the cattle maintained in the free state in summer evidently favored a more efficient heat loss mechanism. In addition, studies on the pilomotor reactions demonstrated that Bushuyevskaya cattle and the black spotted-zebu hybrids are better adapted to the hot continental climate of Uzbekistan than the Latvian brown and black spotted cattle. In all studies, the adaptive changes to seasons was more pronounced in cattle maintained year-round on the range than in cow barns. References 5 (Russian).
[1009-12172/12223]

GENETIC ENGINEERING IN AGRICULTURE

Moscow SELSKAYA ZHIZN in Russian 17 Nov 85 p 2

BUTENKO, R., Corresponding member of USSR Academy of Sciences and All Union Academy of Agricultural Sciences imeni Lenin

[Abstract] Achievements of modern genetic engineering are explained in lay language stressing the potential of biologists to grow huge numbers of cells and even to make whole plants identical in all aspects within a group or to modify some of their properties at will. The paper is limited by the author's choice to monoclonal generation of cells and tissues, preparation of virus-free and noninfected seeds, miniaturization of genetic experiments and introduction of some of these laboratory techniques to practical field applications. This new technology is especially rapid and reproducible in selection of new brands of plants, developing new disease-free agricultural species leading to much increased productivity. [238-7813/12223]

UDC [633.2+579.84]:631.847.21:631.55

RESPONSE OF TIMOTHY AND FESCUE GRASSES TO INOCULATION WITH NITROGEN-FIXING BACTERIA ISOLATED FROM NATURAL ASSOCIATIONS WITH GRASSES

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, Mar 85
(manuscript received 26 Apr 84) pp 48-52

BERESTETSKIY, O. A., VASYUK, L. F., ELISASHVILI, T. A., TIKHOMIROVA, I. A., KORZHENEVSKAYA, N. I. and BASKAKOVA, L. Ye., All-Union Scientific Research Institute of Agricultural Microbiology, Leningrad-Pushkin

[Abstract] Nitrogen-fixing bacteria isolated from the roots of rye grass and rice were used for the pretreatment of timothy (Phleum pratense) and fescue (Festuca arundinaceae) grass seeds, to assess the affects of such treatment on subsequent straw yield and protein content. Field trials conducted for 2 years showed that pretreatment of the seeds with bacteria identified as Arthrobacter sp., Aquaspirillum sp. and Flavobacterium sp. had a positive effect on timothy and fescue development. In general, the straw yield increased by 19.9 to 28.8%, accompanied by an increase in the protein concentration of 1.0 to 2.6%. These observations provide further confirmation of the fact that nonsymbiotic associations between plants and nitrogen-fixing bacteria can have a beneficial effect on the former, and can be more widely used in agricultural practices. References 22; 8 Russian, 14 Western. [1032-12172/12223]

UDC 633.11:[575.222+58.02

FERTILITY OF FIRST BACKCROSS PROGENY (T. DURUM DESF. X T. TIMOPHEEVII ZHUK.) IN RELATION TO WHEAT GENOTYPIC VARIATION AND GROWTH CONDITIONS

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, Mar 85
(manuscript received 18 Jul 84) pp 77-79

KOZLOVSKAYA, V. F. and GRIGORYEVA, L. P., Altay Scientific Research Institute of Agriculture and Breeding, Barnaul

[Abstract] An analysis was conducted on first generation backcross progeny (T. durum Desf. X T. timopheevii Zhuk.) to determine their fertility in relation to climatic conditions and variability in the wheat genetype. The field trials were conducted in the winter/spring season in Altay in 1983, and were complemented by laboratory studies under greenhouse conditions. Determinations of mean values of fertility indices demonstrated that the fertility of F_1BC_1 was 3.2-fold higher when cultivated under greenhouse conditions (23.6%) than under field conditions (7.4%). Thus, growth conditions were demonstrated to exert a profound effect on the outcome of introgressive breeding, and their effects are more noticeable than the effects of genotypic variation in wheat. References 7: 4 Russian, 3 Western.
[1032-12172/12223]

UDC 632.937.32

CRYOPRESERVATION OF GRAIN MOTH EGGS FOR COMMERCIAL BREEDING OF TRICHOGRAMMATIDAE

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 3, Mar 85
(manuscript received 24 Feb 84) pp 118-124

GENNADIYEV, V. G., KHLISTOVSKIY, Ye. D. and POPOV, L. A., North Caucasian Scientific Research Institute of Phytopathology, Krasnodar

[Abstract] Detailed techniques are presented for the cryopreservation of grain moth eggs intended for year-round breeding of Trichogrammatidae. Cryopreservation was conducted under liquid nitrogen in Dewar flasks, with cooling to -196°C conducted rapidly ($<$ 2 sec) to prevent ice crystal formation. Reconstitution after 6 to 12 months showed an infectivity rate of 62.4-65.4% with Eurygaster integriceps (winter wheat stink-bug), with 89.9-91.2% of the infected eggs yielding mature egg-eaters (61.4-63.3% female). Such techniques can be utilized for year-round massive breeding of the Trochogrammatidae at relatively low cost (2.5 kopecks per 1 g of eggs for 6 months). Figures 2; references 12: 11 Russian, 1 Western.
[1032-12172/12223]

UDC 663.15:577.152.34

NEUTRAL PROTEASE OBTAINED ON BASIS OF BACILLUS SUBTILIS STRAIN 81-OG

Moscow MIKROBIOLOGICHESKAYA PROMYSHLENNOST: EKSPRESS-INFORMATSIYA in Russian No 8, Aug 85 p 19

[Abstract in Russian by S.L. Niselevich, under the rubric "Enzymes," of item "Neytralnaya proteaza, poluchennaya na osnove shtamma Bac. subtilis 81-OG" ["A Neutral Protease Obtained on the Basis of Strain 81-OG of Bacillus subtilis"] in "Tematiko-ekspozitsionnyy plan, pavilyon 'Mikrobiologicheskaya promyshlennost', VDNKh SSSR, 1985" ["Subject and Exposition Plan, 'Microbiological Industry' Pavilion, Exhibition of USSR Economic Achievements, 1985"]]

[Text] At the Omutninsk Chemical Plant, production has begun of a neutral protease preparation based upon Bacillus subtilis strain 81-OG, obtained through genetic selection methods by the institute VNIIgenetika [All-Union Genetics and Selection of Microorganisms Scientific Research Institute] jointly with the plant.

The enzyme's activity level reaches 306 units per milliliter. The new strain has a shorter fermentation period and a high specific-product yield, and is resistant to infection. The low viscosity of the strain's culture fluid makes it possible to obtain purified protease preparations for medical purposes. Neutral protease preparations are widely used in livestock and poultry farming as feed supplements, and in the food industry.

The annual economic impact from the introduction has amounted to about 15,000 rubles.

12319
CSO: 1840/152

UDC: 612.822.8:612.822:616-003.725

INFLUENCE OF BIS-QUATERNARY AMMONIUM COMPOUNDS ON Mg^{2+} Ca^{2+}-ATPASE ACTIVITY AND TRANSPORT OF Ca^{2+} IN SARCOPLASMIC RETICULUM OF SKELETAL MUSCLES

Kiev KODLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 85 (manuscript received 5 Feb 85) pp 78-80

FEDOROV, A. N., KURSKIY, M. D. and SKOK, V. I., academician, UkSSR Academy of Sciences, Institute of Biochemistry, Ukrainian Academy of Sciences, Kiev; Institute of Physiology, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Some bis-quaternary ammonium compounds selectively block the transmission of excitation through cholinergic synapses. It is thought that they bond with areas which under normal conditions bond calcium ions. This article tests this suggestion using Mg^{2+}, Ca^{2+}-ATPase in the sarcoplasmic reticulum. Preparations of rabbit skeletal muscle SR were obtained from homogenate by differential centrifugation. Pure SR preparations were used to solubilize Mg^{2+}, Ca^{2+}-ATPase by suspending them in sodium deoxycholate then centrifuging the suspension at 14,000 g for two hours producing electrophoretically homogeneous enzyme preparations. Accumulation and liberation of Ca^{2+} from liposomes and proteoliposomes was determined by millipore filtration using $^{45}CaCl_2$. The results indicate that hexatetra-, hepta- and decamethonium do not influence Mg^{2+}, Ca^{2+}_ ATPase activity in native or solubilized SR. However, the substances studied significantly decreased the capacity of proteoliposomes to accumulate Ca^{2+} in an ATP-dependent process. The results show that the compounds studied do influence either the level of bonding of Ca^{2+} or the level of its translocation through the channel portion of the Mg^{2+}, Ca^{2+}-ATPase molecule. It is thus concluded that decamethonium interacts with a sector normally bonding calcium ions in a nicotinic cholinoreceptor molecule. References 8: 5 Russian, 3 Western.
[070-6508/12223]

UDC 577.115.083

REACTION OF GANGLIOSIDES WITH LYPOSOMAL MEMBRANE

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 85 (manuscript received 27 Apr 84) pp 55-56

BURKHANOV, S. A., SHERTAYEV, M. M. and SAATOV, T. S., Institute of Biochemistry, UzSSR Academy of Sciences

[Abstract] Addition of exogenous gangliosides to cell culture retards cellular growth with increased density of cellular population and increases their sensitivity towards cholera toxins and interferon. To elucidate characteristics of the interaction of gangliosides with membranes, insertion of this type of lipids from cardiac muscle into model membrane systems--the liposomes--was studied. Gangliosides (200 μ) were added to liposomes (the volume corresponding to 1 mg of phospholipids) and incubated for 3 to 24 hrs. Then, the quantity of bound and free gangliosides was determined. On the basis of experimental observation, an assumption was made that, initially, the gangliosides are adsorbed at the surface of liposomes and only then, through their hydrophobic part, do they penetrate into the phospholipid bilayer. To achieve this, prolonged incubation at 37°C, or one lasting only a few hours at 42°C, is required. Figures 2; references 5: 1 Russian (by Western author), 4 Western.
[205-7813/12223]

SECOND DISCOVERY OF INVISIBLES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Nov 85 p 4

POPOV, S., Krasnoyarsk

[Abstract] Scientists of the Siberian Technologic Institute have supported the hypothesis that universal biological regulators--the prostaglandins--are present not only in human and animal cells but also in plants. They isolated these substances from poplar buds. Prof. E. Levin explained that these substances regulate composition and pressure of the blood, prevent development of leukemia, thromboses and even cause contraction or depression of bronchi. Even though prostaglandins were discovered some 30 years ago, they did not find wide application in medicine; the reason for this could be the difficulty of isolating these reagents. The cost of producing prostaglandins was prohibitive in the past, when it was obtained from animals. The ability to obtain them from trees rather than from animals should represent an advance of great proportions. The steps involved in proving this finding were difficult. The idea of producing prostaglandins from the trees presents tremendous potential. However, just the concept of finding them in plant kingdom is a great discovery in itself unifying live processes in the animal and plant world.
[234-7813/12223]

UDC: 577.354(23+24):543.422.27

PHOTO-INDUCED CHANGES IN HYDROPHILIC AREA OF RHODOPSIN. EPR-SPECTROSCOPY STUDY WITH SATURATION TRANSFER

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 9, Sep 85
(manuscript received 7 Mar 85) pp 880-896

POGOZHEVA, I. E., KUZNETSOV, V. A. LIVSHITS, V. A. FEDOROVICH, I.B. and OSTROVSKIY, M. A., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] Determination of the full amino acid sequence of rhodopsin has opened the possibility of localizing and studying the nature of specific photo-induced changes in the hydrophilic portion of the protein for further determination of their functional significance. The question of the association of rhodopsin molecules in the photoreceptor membrane upon illumination is also important. These questions are investigated in the present work by the method of EPR spectroscopy with saturation transfer using spin labels of various structures selectively bonded to the surface SH groups of rhodopsin. An increase was found in the rotational mobility of long spin labels weakly immobilized on rhodopsin in the stage of formation of metarhodopsin II. Detection of photo-induced increases in rotational mobility of rigidly bonded short spin label I in the EPR spectra under microwave saturation conditions is significant; this change is probably not related to an increase in rotational frequency of the protein as a whole in the membrane. An increase in conformational mobility of hydrophilic sectors of rhodopsin in the stage of formation of metarhodopsin II is detected. The quantitative analysis of photo-induced changes in EPR spectra of spin labels using data on the distribution of labels among various SH groups in the protein leads to the conclusion that there is no photo-induced association of rhodopsin molecules in the membrane. Figures 6; references 49: 18 Russian, 31 Western.
[093-6508 /12223]

UDC: 577.354(23+24):543.422.27

CONFORMATIONAL MOBILITY AND INTERACTION OF DOMAINS IN RHODOPSIN

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 9, Sep 85
(manuscript received 7 Mar 85) pp 897-905

POGOZHEVA, I. D., KUZNETSOV, V. A., LIVSHITS, V. A. and OSTROVSKIY, M. A.,
Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] A previous work detected structural changes in the hydrophilic area of rhodopsin during the formation of metarhodopsin II leading to an increase in rotational mobility of spin labels bonded with the Cys^{140} and Cys^{316} groups. The task of the present work was to study the nature of these changes and the transmission of conformational changes from the chromophor 11-cis-retinal group located in the hydrophobic area of rhodopsin to the surface of the membrane. A method of limited papaine proteolysis was used, during which rhodopsin in split into two membrane-bonded fragments, the smaller of which contains the 11-cis-retinal group. Changes in the mobility of spin labels were studied as a function of the degree of proteolysis both in darkness and during formation and decay of metarhodopsin II. The variation of photo-induced changes in formation and decay of metarhodopsin II as a function the degree of proteolysis is used to determine the degree of changes in both regions of bonding of labels in each rhodopsin fragment. The degree of photo-induced conformational changes in various stages of proteolysis of rhodopsin increases symbatically with a decrease in mobility of the rigidly bonded label. This correlates well with data on acceleration of the formation of metarhodopsin II after partial proteolysis. Figures 6; references 13: 5 Russian, 8 Western.
[093-6508/12223]

UDC: 577.32:577.352.26

INFLUENCE OF α-LATROTOXIN ON FUSING OF LIPOSOMES WITH PHOSPHOLIPID BILAYER MEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 9, Sep 85
(manuscript received 16 May 85) pp 940-943

SOKOLOV, Yu. V., CHANTURIYA, A. N. and LISHKO, V. K., Institute of Biochemistry imeni A. V. Palladin, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] It is assumed that α-latrotoxin can induce fusing of membranes. The object of the study was a liposome model system--a bilayer lipid membrane, since this has been well studied and is widely used in fusion studies. When α-latrotoxin was introduced to a cell containing bilayer lipid membranes, conductivity increased. When the cis side of the membrane was perfused with A buffer, conductivity stabilized. Amphotericin B was used to study the interaction of the membranes with liposomes. When liposome was introduced to the cis side of the membrane, no significant changes in current were observed through the membrane. Introduction of the liposome on the trans side of the membrane caused an increase in current by 10 to 15% after 10 to 20 minutes, a shifting of the reversion potential by 10-12 mV. Similar results were obtained with membranes modified by α-latrotoxin. α-Latrotoxin was highly effective in the fusion process, but the authors did not succeed in determining the quantity of liposome fused with the membrane. The results do not allow determination of the mechanism of induction of fusion under the influence of α-latrotoxin, but the toxin can apparently cause local disturbances in the structure of the phospholipid bilayer. Figures 2; references 19: 7 Russian, 12 Western.
[093-6508/12223]

UDC 577.352.2:547.639.5.07:542.95.541.49

POTASSIUM-SODIUM SELECTIVITY OF LIPID MEMBRANES MODIFIED WITH CROWN-ESTERS

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 85
(manuscript received 21 May 84) pp 6-8

MIRKHODZHAYEV, U. Z., SAYFULLINA, N. Zh. and TASHMUKHAMEDOVA, A. K.,
Tashkent Order of the Labor Red Banner State University imeni V. I. Lenin

[Abstract] K/Na selectivity of lipid membranes modified with crown esters varying in the size of macrocycles and in the nature of and the length of benzene ring substituents was investigated using the following crown derivatives: n-alkyl and hydroxyalkyldibenzo-18-crown-6, ethyl-benzo-15-crown-5, dibenzo-18-crown-6, dibenzo-24-crown-8 and dibenzo-30-crown-10. Flat bilayer phospholipid membranes were prepared from bovine brain by the Mueller method. It was shown that K/Na selectivity of these membranes depended on the number of oxygen atoms in the cycle and on the dimensions of the macrocyles' surface. The length and the type of side chain substituents on the benzene ring had little, if any, effect on the selectivity. Figure 1; references 8: 2 Russian, 6 Western.
[205-7813/12223]

UDC 061.3:/331.876.6:663.1/

MEETING OF OUTSTANDING MICROBIOLOGICAL INDUSTRY WORKERS AT EXHIBITION OF USSR NATIONAL ECONOMIC ACHIEVEMENTS

Moscow MIKROBIOLOGICHESKAYA PROMYSHLENNOST: EKSPRESS-INFORMATSIYA in Russian No 8, Aug 85 pp 1-12

[Synopsis by N.B. Zotova, Ye.A. Andreyeva and M.A. Yusipova, under the rubric "Management of Production, Scientific Labor Organization," of "Vstrecha peredovikov mikrobiologicheskoy promyshlennosti na VDNKh SSSR" ["Meeting of Outstanding Workers of the Microbiological Industry at the Exhibition of USSR National Economic Achievements"], Moscow, Tezisy dokladov [Report Theses], 1985]

[Excerpts] The annual meeting of outstanding workers and innovators of Glavmikrobioprom [Main Administration of the Microbiological Industry] enterprises and organizations, winners of the 1984 socialist competition, took place at the VDNKh SSSR [Exhibition of USSR National Economic Achievements], in the Microbiological Industry Pavilion. Among participants at the meeting were representatives of the Main Administration, the VPO's [All-Union Production Associations], the VNIISENTI [All-Union Microbiological Industry Scientific Research Institute for Management Systems, Economic Research, and Scientific and Technical Information], and industry institutes and enterprises.

In the Soyuzprombelok [All-Union Industrial Protein] section, Senior Scientific Associate M.M. Rozhkova of the institute VNIIsintezbelok [All-Union Scientific Research Institute for Protein Synthesis] elucidated the basic directions of scientific research work being done at the institute. Particular attention was devoted to the work on producing heat-tolerant yeast strains and cultures, capable of being developed in "Parex" ["Pareks"] n-paraffins. Prospects for industrial production of feed yeasts from natural gases, methanol, and ethanol were outlined in the report. The need was pointed out for equipment modernization and automation in the nutrient-salts preparation shop, and a shift to the use of sludgeless salts. The prospects of using new fermenters (ADR-900, modernized), separators of greater capacity (60-100 m^3/hour), and also dryer-granulators were outlined. Problems of intensifying sewage purification, and ways of utilizing activated sludge, were examined in the report. Great attention was devoted to questions of all-around use of yeasts' metabolic products (polysaccharides, fatty acid lipids) for the purpose of producing useful products: vitamins, medical preparations, detergents, etc.

A report by V.N. Nesterov, Kremenchug BVK [Protein and Vitamin Concentrates] Plant brigade leader, was heard. He told about measures being taken at the plant for the purpose of increasing labor productivity. Thus, the cleaning of mechanical inclusions and sediment out of salt solutions, and their fine cleaning, are being practiced at the plant. Moreover, the batching of salt solutions in the nutrient-salts department is being done by means of concentration meters and the Potok-101 EVM [electronic computer], which significantly improves and stabilizes the fermenters' salt supply and leads to appreciable raw-material economy. Work is being done to introduce concentration meters and the Potok-101 computer on the trace-elements-preparation technology line.

Using the surfactant syntonol in the fermentation process increases the productivity of a single fermenter by 18 percent, and reduces the paraffin expenditure coefficient by 10 percent. Further redesigning of fermenters, which will permit increasing the apparatuses' productivity, is being carried out.

K.P. Greshnykh, associate of the institute VNIIbiotekhnologiya [All-Union Biotechnology Scientific Research Institute], advised of the development of a technology for producing highly concentrated forms of (batsilikhin) with antibiotic contents of 60, 90 and 120 grams per kilogram of the product, as well as new, chalk-containing forms of the preparation. A technology for obtaining bacitracin with the use of zinc sulfate has been proposed by the institute. Recommendations, applicable to the industry's plants, which will further intensification of the drying process for feed (grisine), have been worked out. A new (grisine) producer strain has been introduced, which has permitted significantly increasing the equipment economy indices of the industry's work.

V.U. Roshal (VNIIbiotekhnologiya) noted the basic directions in improving lysine production: Obtaining and developing highly productive producer strains, ensuring sterility in production, and intensifying biosynthesis. Thus, at the Livany BKhZ [Biochemical Plant], there has been introduced a heat-tolerant strain, which possesses as much activity at 37 degrees Celsius as its analog at 30-32 degrees Celsius, something very important because of the difficulty of preventing overheating of apparatuses and air in the shops in summer. At the (Tripolskiy) Biochemical Plant, a bottom-driven agitator is being operated successfully, and this promotes intensification of lysine biosynthesis. The antifoam agent proposed by the institute VNIIgenetika [All-Union Genetics and Selection of Microorganisms Scientific Research Institute] will permit increasing the duty-cycle coefficient of fermenters and, accordingly, the output from the apparatuses.

A report about introduction at the Shebekino and Livany Biochemical Plants of a highly effective (96 percent) "modular gas washer," developed at the institute VNIIbiotekhnika [All-Union Bioengineering Scientific Research Institute], and used for cleaning gas emissions in the technological process for obtaining lysine, aroused great interest. The modular gas washer has low hydraulic resistance. Unlike the Venturi scrubber, fluctuations in the discharge of gases being cleaned do not influence its effectiveness.

L.N. Krayev (VNIIgidroliz [All-Union Scientific Research Institute for Hydrolysis of Plant Materials]) reported on the results of introducing a hydrolytic system with "return percolation" (at the Arkhangelsk GZ [Hydrolysis Plant]) and a two-step hydrolysis system with separate extraction of pentose and hexose hydrolysates (at the Ivdel and Rechitsa Hydrolysis Plants).

In order to increase the productivity of batch-output hydrolysis apparatuses, it is necessary to decrease the hydrolysis apparatus's turnover time by means of a higher percolation rate, and increase the output of RV [not further identified] from the a.s.s. [not further identified] mass. At present, the average hydrolysis apparatus's output coefficient is approximately equal to 0.7. To increase this indicator, VNIIgidroliz, jointly with the Arkhangelsk Hydrolysis Plant, has developed and introduced a method of hydrolysis with removal of hydrolysate through a central filter and a method of hydrolysis with upward flows. The first method is recommended for hydrolysis apparatuses of 18-40 m^3 capacity, and the second for hydrolysis apparatuses of 50-160 m^3 capacity. Introduction of such hydrolysis methods at the Arkhangelsk Hydrolysis Plant has permitted increasing the specific productivity of a hydrolysis apparatus by a factor of 1.5. Instructional material for reconstructing batch-output hydrolysis apparatuses has been worked up and sent out to the industry's plants by VNIIgidroliz.

For reducing liquid flow and increasing RV [not further identified] concentration in the hydrolysate, a method of two-step hydrolysis, with the return of hexose hydrolysate to the load and the first stage of digestion, has been developed and tested at the Arkhangelsk Hydrolysis Plant.

The introduction of such a method of hydrolysis permits:

Reducing liquid flow by 30-40 percent;

reducing the steam expenditure for digestion by 10-15 percent;

reducing the steam expenditure for rectifying alcohol by 15-20 percent;

reducing the sulfuric acid expenditure by 30-40 percent;

reducing the fresh water expenditure by 30-40 percent;

increasing RV [not further identified] concentration in the hydrolysate to 4.5 percent.

12319
CSO: 1840/152

QUO VADIS, BIOTECHNOLOGY?

Riga NAUKA I TEKHNIKI in Russian No 11, Nov 85, pp 6-8

[Article by Uldis Ernestovich Viestur and Ieva Aleksandrovna Shmite]

[Excerpts] Uldis Ernestovich Viestur (born in 1936 in Saldusskiy Rayon) heads the laboratory of bioengineering at the Institute of Microbiology imeni A. Kirkhenstein of the Academy of Sciences of the Latvian SSR. He is a doctor of technical sciences (1984), professor, corresponding member of the Academy of Sciences of the Latvian SSR, twice laureate of the State Prize of the Latvian SSR and Honored Inventor of the Republic. He is the author of 96 inventions and some 200 scientific publications.

Ieva Aleksandrovna Shmite (born in Riga) is a senior scientific employee of the Institute of Microbiology imeni A. Kirkhenstein of the Academy of Sciences of the Latvian SSR. She is a candidate of biological sciences (1982). Since 1983 she has worked at the laboratory of bioengineering. She is the author of 20 inventions and 25 scientific publications.

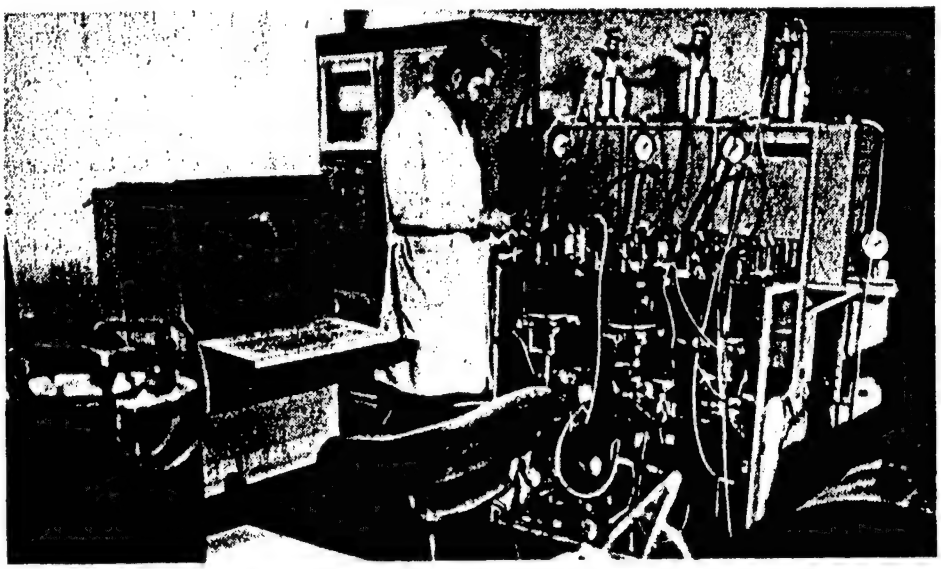
Biotechnology is often concerned with genetic engineering manipulations, as a result of which new cultures and other biological agents are obtained. Generally speaking, without going into details which are only of importance to specialists, these terms are synonymous. The future of biotechnology lies in the expansion of the wide variety of biological agents created by methods of genetic engineering, and thus also of technological processes and finished products.

It is now possible to obtain microorganisms, superproducers of valuable proteins, including enzymes, and also to endow the cells of these superproducers with the capacity to release a product into the cultivation medium.

The cultivation of plant cells in biotechnology presents great prospects, that is, the cultivation of individual cells or groups of cells in liquid or solid media. They have proven to be two to three times as efficient in synthesizing well-known biologically active compounds which until now have been extracted from whole plants, such as alkaloids, amino acids, ferments, aromatic compounds, growth regulators, pharmacological preparations and others.

By means of cell engineering, the fusing of protoplasts of somatic (nonreproductive) cells with subsequent regeneration of whole plants, it is possible to indirectly crossbreed plants and to obtain hybrids with improved

properties, increased capacity for photosynthesis and nitrogen fixation and increased resistance to stress factors and pathogens.



The processes for obtaining microbic protein are studied with the aid of the universal computer system "Fermentator." (The photo shows group leader Andrei Berzinsh.)

Of particular importance is the technology of ferments, so-called engineering enzimology, where enzymes, especially immobilized ones, that is, those linked with the insoluble carrier of the enzymes, including the cells of microbes, plants and animals, are used as the biological agent (the active initiator in biotechnological transformations). Its goal is to obtain biologically active molecules which allow the creation of new preparations and products. Such immobilized enzymes (whose molecules are in some way linked with the carrier) can be used as biosensors, as well as in large-scale production processes in the food industry and other industries.

If attempts to carry out direct transfer of electrons from the active center of an immobilized enzymes to an electrode succeed, it will be possible to develop electrochemical transformers of energy, systems of electrosynthesis of complex biological compounds and analytical sensors (biosensors). A model of a biological sensor system includes a biosensor (enzymes, a polyenzyme system, etc.) which is immobilized in direct contact with an appropriate transforming device for turning a biochemical reaction into a quantitative electric or optical signal. Such systems permit instantaneous biochemical

analyses to be conducted, including those in the field of medicine.

Photosynthesis is one of nature's key life processes. Investigations into the possibility of creating photobiological systems for transforming energy will apparently, sooner or later, make it possible to find new sources of food, fuel, fiber and chemical substances. Admittedly, we may only have to wait until the next century for these results.

In order to transform products of photosynthesis, methods of direct cultivation of microorganisms, that is, biotechnological processes, are being intensively developed. Thus, attempts are being undertaken, for example, to genetically construct essentially new strains of yeasts which are capable of directly transforming cellulose and starch into ethanol or microbic proteins.

In Latvia biotechnology has been acknowledged as one of the priority areas. Of primary interest are;
the modernization of fermenting and other food production processes;
genetic and cell engineering;
the biotechnology of the processing of agricultural raw materials and wastes;
the utilization of farm wastes;
the bioconversion (transformation) of cellulose and lignin raw materials;
the improvement of apparatus for microbe synthesis;
the expansion of the production and use of enzymes, as well as other biologically active substances;
the creation of biological means for protecting plants and bacterial fertilizers.

Currently operating in Latvia are the Livanskiy Experimental Biochemical Plant which produces feed lysine and VAP [expansion unknown], the department of feed yeasts of the Slokskiy Cellulose and Paper Combine, the Riga Yeast Plant of the "Druva" Association, the Tukumskiy Enzyme Plant, the biodepartment and department of itaconic acid of the "Biolar" Scientific and Industrial Association in Olayne, experimental plants and installations of the institutes of the Academy of Sciences of the Latvian SSR and several others. Biotechnology has also taken confident steps in agriculture. The experimental installations for feed production at the "Uzvar" kolkhoz of Bauskiy Rayon and two bioreactors for the breakdown of sewage water from a pig farm at the "Ogra" sovkhoz are operating efficiently. The transformation of products of photosynthesis is being expanded.

Theoretical research efforts are being conducted at the Institute of Microbiology imeni A. Kirkhenstein, at the Institute of Organic Synthesis of the Academy of Sciences of the Latvian SSR and at the "Biolar" Scientific and Industrial Association. Cooperation with scientists from other fraternal republics is growing.

12793
CSO: 1840/212

UDC 663.14.033.84

YEAST SEPARATOR MODEL SDL-M

Moscow MIKROBIOLOGICHESKAYA PROMYSHLENNOST: EKSPRESS-INFORMATSIYA in Russian No 8, Aug 85 p 13

[Abstract in Russian by T.O. Borodina, under the rubric "Processes and Apparatuses of Microbiological and Hydrolysis Production," of item "Drozhzhevoy separator modeli SDL-M" ["Yeast Separator of Model SDL-M"] in "Tematiko-ekspozitsionnyy plan, pavilyon 'Mikrobiologicheskaya promyshlennost', VDNKh SSSR, 1985" ["Subject and Exposition Plan, 'Microbiological Industry' Pavilion, Exhibition of USSR Economic Achievements, 1985"]]

[Text] At the institute VNIIbiotekhnika [All-Union Bioengineering Scientific Research Institute], a separator has been developed, intended for separating yeast suspensions of various types (baker's, hydrolytic, obtained on paraffins and synthetic media).

The separator consists of a drum, in which provision is made for continuous output of separated (fugate) and concentrate under pressure, an inlet-outlet arrangement, and a yeast-concentrate or washing-fluid recirculation system. It differs from existing devices of its kind in that provision is made in the drum's design for the possibility of additional concentration of biomass and in-place washing, in addition to simultaneous performance of the separation process and washing.

Technical Characteristics

Measured Feature, Units of Measurement	Measurement
Overall dimensions, millimeters	1748 X 1216 X 1844
Drum diameter, millimeters	650
Productivity, cubic meters per hour	50-60
Drum rotation frequency, minutes^{-1}	5000
Electric motor power, kilowatts	75
Weight, kilograms	2583

The separator is intended for use in the microbiological, food, and medical industries. It can replace existing separators of models SOS-501K-3, SOS-501-T-2, and SDS-531K-01 manufactured by the Uralkhimmash PO [Ural Heavy Chemical Machine Building Production Association]. Its price is 30,000 rubles.

The separator has been tested at the Novopolotsk BVK [Protein and Vitamin Concentrates] Plant, and is recommended for widespread introduction.

The economic impact of the separator's use in producing 100,000 metric tons of BVK per annum is 133,000 rubles.

In the matter of obtaining technical documents and consultation, make application to the address: 119034, Moskva, ul. Kropotkinskaya, 38, VNIIbiotekhnika, tel. 246-77-64 [VNIIbiotekhnika, 38 Kropotkinskaya St., Moscow 119034, Tel. 246-77-64].

12319
CSO: 1840/152

UDC /663.18:577.112/:582.26

PROTEIN HYDROLYSATE FROM MICROSCOPIC ALGAE

Moscow MIKROBIOLOGICHESKAYA PROMYSHLENNOST: EKSPRESS-INFORMATSIYA in Russian No 8, Aug 85 p 18

[Abstract in Russian by G.I. Bagmet, under the rubric "Protein Substances," of item "Belkovyy gidrolizat iz mikrovodorosley" ["Protein Hydrolysate from Microscopic Algae"] in "Tematiko-ekspozitsionnyy plan, pavilyon 'Mikrobiologicheskaya promyshlennost', VDNKh SSSR, 1985" ["Subject and Exposition Plan, 'Microbiological Industry' Pavilion, Exhibition of USSR Economic Achievements, 1985"]]

[Text] Producing biomass of microscopic algae permits their use, not only as a protein and vitamin supplement in farm animals' feed, but also as raw material for obtaining various useful products.

At the institute VNIIbiotekhnika [All-Union Bioengineering Scientific Research Institute], a technology has been developed for obtaining protein hydrolysate from a biomass of Chlorella or Spirulina by the method of two-step fermentative hydrolysis. From 1 metric ton of microscopic algae biomass, no less than 0.2 metric ton of protein hydrolysate is obtained, containing up to 60 percent free amino acids, as well as a series of water-soluble vitamins.

Using the Chlorella hydrolysate as a component of the nutrient media for microorganisms and cultures of isolated plant and animal cells permits replacing the food raw material from which the protein bases are prepared at present. Thus, 1 kilogram of the hydrolysate can replace 30 kilograms of meat. The protein hydrolysate from Chlorella also is a prospective raw material in producing cosmetic and perfume products.

The Chlorella biomass residue (meal), after removal of the hydrolysate, contains vitamins, and is about 20 percent nitrogenous substances, mainly in the form of free amino acids, and thus it can be used as feed for farm animals.

The economic impact, when producing 1 metric ton of the hydrolysate, amounts to 90,000 rubles.

12319
CSO: 1840/152

UDC 582.232

DYNAMICS OF POPULATION OF THREE SPECIES OF BLACK SEA DYNOFLAGELLATES IN MIXED CULTURES

Moscow BIOLOGICHESKIYE NAUKI in Russian No 11, Nov 85 pp 67-74

[Extract] (This abstract is an editing of an English-language summary in the source journal): The dynamics of three dynoflagellate species Glenodinium foliaceum, Prorocentrum micans and Exuviaella cordata has been analysed in two- and three-species cultures under two levels of nutrition enrichment. It has been shown that interspecific interaction is fully accounted for by resource competition. In the two-species cultures of G. foliaceum and E. cordata, at the early period of their development, growth of E. cordata is suppressed by metabolic products of G. foliaceum; stronger inhibition has been observed in the media with higher initial level of nutrition enrichment. When the abundance of G. foliaceum reaches its maximum and then declines, pronounced growth of E. cordata is restored. It has been found that under conditions of mineral-component deficiency, metabolism changes from photorophic to heterotrophic in E. cordata. This results in increasing of that alga's growth rate at those stages of joint cultivation with P. micans where the limiting resource is already exhausted and in reaching (together with G. foliaceum) maximum population which even surpasses that in single-species cultures.

CSO: 1840/224E

UDC 547.362+632.786+543.51

NOVEL APPROACH TO PHEROMONE STUDY

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 285, No 1, Nov 85 (manuscript received 3 Jan 85) pp 137-139

RAZAKOV, R. R., IRGASHEVA, G. A., ABDUVAKHABOV, A. A. and SADYKOV, A.S., academician, Institute of Bioorganic Chemistry, Uzbek SSR Academy of Sciences, Tashkent

[Abstract] In view of the fact the pheromones do not lend themselves to mass spectrometry because of lability when struck by electrons and consequent low intensity or absence of molecular ion (M^+) peaks, metastable defocusing and direct analysis of daughter ions (DADI) was employed in an analysis of a series of pheromones. The use of metastable defocusing and DADI made possible identification of minor components of pheromones which are not apparent by other techniques. The importance of identification of the MWs of the minor components, in addition to the major species, lies in the fact that the former frequently account for the specificity of action and effectiveness of pheromones in field trials. Figures 1; references 8: 5 Russian, 3 Western.
[175-12172/12223]

KOMSOMOL PRIZE RECIPIENTS FOR GENETIC ENGINEERING METHODS

Moscow KOMSOMOLSKAYA PRAVDA in Russian 5 Dec 85 p 1

[Text] The field in which Candidate of Chemical Sciences Viktoras Butkus, head of a laboratory of the "Ferment" (enzyme) Research and Production Association, Yurate Bitinayte and Pyatras Stakenas work is younger than they are. It is genetic engineering. This term still has a ring of extraordinary wonder about it. But for these young Vil'nyus specialists, it is their work. They were members of a group of scientists which has been awarded the 1985 Leninist Communist Youth League (Leninskiy Komsomol) Prize in science and technology for research entitled "New Enzyme and Chemical Methods for Purposefully Directed DNA Mutagenesis, Modification and Restriction, for Genetic Engineering".

(A photograph shows Butkus, Bitinayte and Stekenas working with a computer terminal and photographs.)

FTD/SNAP
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1840/243

UDC: 579.842.11.088.1

PROTECTIVE EFFECT OF ANTIOXIDANTS ON ESCHERICHIA COLI WITH IMMOBILIZATION OF CELLS IN POLYACRYLAMIDE GEL

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85
(manuscript received 21 Feb 84) pp 730-734

STAROSTINA, N. G., LUSTA, K. A. and FIKHTE, B. A., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] Formation of polyacrylamide gel, widely used as a carrier to immobilize microorganism cells, is a free-radical process. This work studies the possibility of using antioxidants to reduce the effect of the free radicals on immobilized cells of escherichia coli in order to improve their viability. Antioxidants used included ionol, phenozan, epigid, hydroquinone and glutathione, solutions of the substances poured into the cell suspensions immediately before mixing with the polymerization mixture. Ionol was added as a dry powder to the washed cell sediment, mixed and let stand 1-2 hours. The antioxidants, except ionols, significantly inhibited the process of formation of the gel, increasing the time necessary to form the gel. The inhibitors decreased the temperature rise of gel formation. Apigid, glutathione and ionol significantly increased the number of viable cells; phenozan and hydroquinone decreased the number of viable cells sharply. References 15: 11 Russian, 4 Western.
[196-6508/12223]

UDC: 579.842.11.017.6

INFLUENCE OF GLUCOSE METABOLISM PRODUCTS ON GROWTH OF RECOMBINANT ESCHERICHIA COLI STRAIN--DNA--POLYMERASE SUPER PRODUCER

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85 (manuscript received 27 Feb 84) pp 740-744

SOKTOYEV, S. A., DUGAN, I. N. and SHKIDCHENKO, A. N., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] The purpose of this work was to study the possible inhibiting effect of glucose metabolism products on the growth of E. coli under continuous cultivation conditions. The recombinant strain of E. coli SM 5199 (λ.polA) was studied on a synthetic nutrient medium with glucose as the only carbon source. Longterm continuous cultivation with various medium flow rates allow the effect of the limiting and inhibiting factors of growth limitation of the population to be isolated. Acetate and ethanol were found in the culture fluid. At low culture flow rates, the E. coli were able to metabolize the acetate and ethanol formed. As the flow rate increased, the cells liberated increasing quantities of these metabolites until their concentration began to limit the rate of cell growth. Further experiments proved the inhibition of E. coli growth rate by acetate. In spite of the short contact time of the culture with acetate under high medium flow rate conditions, even low acetate concentrations decreased the specific growth rate of the producer by 10 to 15%. Figures 3, references 10: 3 Russian, 7 Western. [196-6508/12223]

INTERVIEW WITH A. A. BAYEV ON PROGRESS OF BIOTECHNOLOGY

Moscow NTR: PROBLEMY I RESHENIYA in Russian No 11, 22 Oct-4Nov 85 p 5

[Abstract] The article is a lengthy interview with academician A. A. Bayev, academician-secretary of the USSR Academy of Sciences' Department of Biochemistry, Biophysics and Chemistry of Physiologically Active Compounds, regarding accomplishments and directions of biotechnology. He responds to questions about what biotechnology can do in meeting needs of agriculture and medicine. He mentions that his laboratory is working on a growth hormone, for example, which may be useful in treating burns and bone fractures in addition to correcting growth disorders. This hormone is being produced according to a biotechnology method that uses yeast cells, and the yield is measured in grams, which represents a great increase over previous methods, according to Bayev.

FTD/SNAP
/12223
CSO: 1840/242

SUCCESSES IN GENETIC ENGINEERING

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 26 Nov 85 p 4

Lagovskiy, V., correspondent [interviewer]

[Abstract] The article is an interview with Doctor of Biological Sciences Konstantin Georgiyevich Skryabin, USSR State Prize laureate, regarding the possibilities and prospects of genetic engineering. He notes that the progress which has been made in this field in the Soviet Union is due largely to academician Aleksandr Aleksandrovich Bayev. Skryabin mentions that Bayev literally forced him and his other pupils to work on topics that were outside the traditional thematics of the USSR Academy of Sciences' Institute of Molecular Biology. As a result, Skryabin boasts that now almost every scientific publication of this institute's associates leads to the awarding of an author's certificate of invention for a specific technology. He reports that human growth hormone that was synthesized in his laboratory by means of genetic engineering is now undergoing preclinical testing.* The hormone calcitonin also has been synthesized. Researchers now are working on a vaccine against hepatitis B, according to Skryabin.

Going on the comment on prospects of genetic engineering, Skryabin says he thinks substitution of defective genes in human embryos is a technique that should be explored in the near future. He reports that scientists of the USSR Academy of Sciences' Institute of General Genetics and of the USSR Academy of Medical Sciences' Institute of Experimental Medicine did an experiment in which a human gene that controls production of growth hormone was implanted into a mouse embryo. The mouse that was born reportedly grew twice as fast as its siblings. Skryabin also reports that his laboratory recently synthesized a cattle growth hormone. When fed to dairy cows, it is said to increase their yield of milk by as much as 40 percent.

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* See also the Daily SNAP, December 16, 1985, p 1, col 2

FTD/SNAP
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CSO: 1840/242

UDC 577.47:004.5

BIOMONITORING OF ENVIRONMENT

Moscow ZHURNAL OBSHCHEY BIOLOGII in Russian Vol 46, No 6, Nov-Dec 85 (manuscript received 1 Apr 85) pp 743-752

SALANKI, J., Balaton Limnology Scientific Research Institute, Hungarian Academy of Sciences, Tihan, Hungary

[Abstract] This article is a lecture delivered at a symposium of New Delhi (India), 12 Oct 84 and translated for this journal by G. M. Piskunova. The author addressed various biological test systems that could be used for detection and control of pollutants. Six groups of bioindicators were listed: microorganisms, lower plants such as lichens and fungi, zoological specimens, cellular biology and genetics components, various techniques of comparative physiology and hydrobiological distribution patterns. Special attention was given to molluscs serving as accumulators of heavy metals (Anodonta cygnea L. and Unio dictorum L). While accumulating in the tissues of molluscs, these metals alter their filtration activity; this aspect could be used as a monitoring signal. They also affect chemosensitivity of neuronal membranes to natural synaptic transmitters serving as another monitoring signal. Figures 4; references: 10 (Western). [204-7813/12223]

UDC 576.895.42

EFFECT OF FOREST FIRES ON ABUNDANCE AND SPACIAL STRUCTURE OF TAIGA TICK POPULATION (IXODIDAE)

Leningrad PARAZITOLOGIYA in Russian Vol 19, No 4, Jul-Aug 85 (manuscript received 9 Apr 84) pp 268-272

GORELOVA, N. B. and KOVALEVSKIY, Yu. V., Scientific Research Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Data on the effect of forest fires on the abundance and distribution of ixodes persulcatus tick--the principal carrier of tick encephalitis--are scarce. No serial observations were carried out looking at the reestablishment of such populations after forest fires. In this paper such observations carried out during the first decade after a burn-out of a region are reported. The observation area was burned down in 1973, leaving only scattered trees surviving the fire. The study observations were performed in 1975 and again in 1983. The first observation showed considerable drop in tick population at the fire site (one fourth of the control values). The observations carried out 10 years later showed virtually complete repopulation of ticks, even though the vegetation at that time did not yet return to its normal growth. Figures 3; references: 11 (Russian).
[1008-7813/12223]

UDC 576.895.775:576.851.45

REPRODUCTION PATTERN OF VIRULENT STRAIN OF PLAGUE MICROBE IN XENOPSYLLA CHEOPSIS FLEAS INFECTED PARENTERALLY

Leningrad PARAZITOLOGIYA in Russian Vol 19, No 4, Jul-Aug 85
(manuscript received 1 Jun 84) pp 273-276

VASHCHENOK, V. S., SHCHEDRIN, V. I. and OSIPOVA, S. P., Zoological Institute, USSR Academy of Sciences Leningrad; Scientific Antiplague Research Institute of Caucasus and Transcaucasus, Stavropol

[Abstract] The primary dwelling site for various pathogens of bacterial infections in flea organisms is their digestive tract. In this paper, experimental results were reported on parenteral infection of Xenopsylla cheopsis Roth., fleas with a highly virulent strain of plague microbe. It was shown that parenteral introductino of these microbes led to a persistent infection of fleas who remained infected through the entire life span. These pathogens retained their reproductive activity although at a reduced level. The quantity of plague microbes thus introduced was 2-3 orders of magnitude lower than that of other organisms infected by gavage. During the first few days after infection, the number of microbes increased slightly and then became stabilized. The life span of the host fleas did not change after parenteral infection with these plague microbes. Figure 1; references: 7 (Russian).
[1008-7813/12223]

UDC 595.42:599

ESTIMATION OF SMALL MAMMALS' IMMUNITY IN RELATIONSHIP TO INFESTATION BY TAIGA TICK LARVAE AND NYMPHS

Moscow BYULLETEN MOSKOVSKOGO OBSHCHESTVA ISPYTATELEY PRIRODY: OTDEL BIOLOGICHESKIY in Russian Vol 90, No 30, May-Jun 85 (manuscript received 1 Mar 84) pp 31-36

GUTOVA, V. P. NAUMOV, R. L. and LABZIN, V. V.

[Abstract] There are conflicting data reported in literature on the relationship between the immunity of small mammals and the degree of their infestation by taiga ticks. In an earlier paper, this problem was analyzed in a mountainous region where the infestation level decreased with elevation. In the present paper, results are reported on areas of artifically-decreased levels of tick infestation and on control data and, also, of observations gathered for many years in areas in which changes in the infestation levels of animals were seen. The results agreed well with the earlier analyses which did not show any significant relationship between the level of animal immunity and infestation with ticks. This showed how complex is the quantitative relationship of the components of parasitic system of tick encephalitis. This material supports the original assumption concerning specific regularities of the development of each component of such a system influenced by endogenous and exogenous factors. References: 8 (Russian). [1002-7813/12223]

UDC 618.19-006.881-018.1+618.19-006.6-018.81+618.19-006.481-018.1]-076:575.113

IDENTIFICATION OF TRANSFORMING GENE Ha-ras IN MELANOMA, NEUROBLASTOMA AND HUMAN BREAST CANCER CELLS

Leningrad VOPROSY ONKOLOGII in Russian Vol 31, No 6, Jun 85
(manuscript received 29 Nov 84) pp 77-85

KNYAZEV, P.G., SHEFER, R., VILLEKE, K and SEYTS, I.F., Order of the Labor Red Banner Scientific Research Institute of Oncology imeni Prof. N. N. Petrov, USSR Ministry of Health; Institute of Cell Biology (Tumor Studies), University of Essen, West Germany

[Abstract] Screening results in NIH 3T3 cells were reported to the transforming activity of 21 preparations of DNA from the biopsy materials of human tumors and from tumor cell lines. It was shown that DNA preparations--from malignant melanoma, breast cancer cell line and neuroblastoma--contained transforming Ha-ras type genes which were highly effective in causing substrate dependent proliferation and malignancy formation of the recepient cells of NIH 3T3 mice. Transformed NIH 3T3 cells were highly tumorigenic in BALB/c mice. These transforming genes appeared to be activated c-Ha-loci of DNA from the tumors studied (Ja-c-Ha-ras I, LA-N-c-Ha-ras I and SK-BR-c-Ha-ras I respectively). No differences were seen among these genes, except for data of restriction nucleases EcoRT, Bam H I and Hpa II. Figures 4; references: 16 (Western).
[216-7813/12223]

UDC: 579.842.11:579.253.4:577.2].04:[615.281+615.277.3

INFLUENCE OF DIOXIDIN, ANTITUMOR AGENTS, AND OTHER MUTAGENIC AGENTS ON PRECISE EXCISION OF TRANSPOSONS Tn1 AND Tn10 IN E. COLI. K12

Moscow MOLEKULYARNAYA GENETIKA, MIKROBIOLOGIYA VIRUSOLOGIYA in Russian
No 8, Aug 85 (manuscript received 17 Dec 84) pp 15-19

BAKAI, T.S. and FONSHTEYN, L.M., Scientific Research Institute for Biological Testing of Chemical Compounds, Kupavna, Moscow Oblast

[Abstract] A study was made of precise excision of transposons Tn1 and Tn10 in E. Coli K12 upon exposure to chemical compounds having mutagenic activity, including drugs used in chemotherapy of bacterial infections and tumors. Tests were performed with dioxidin, N-nitro-M-methylurea, photrin, phopurine, thiophosphamide, phosphamide, rongeron, sodium azide, 2-nitrofluorene, 2,7-diamino-4,9 dioxy-5,10-dioxo-4,5,9,10-tetrahydro-4,9-diazopyrene (DDDTDP). The data on the influence of the dioxidin on precise excision of Tn1 and Tn10, as well as the effects of the plasmids R245 and pKM101 on this process, indicate similarity of the mechanisms of precise excision stimulated by dioxidin and UV light. The compounds studied differ both in their capability to induce precise excision of transposons of various classes and the effectiveness of their influence on the frequency of the process. The mechanism of induction of precise excision of Tn1 and Tn10 apparently differs. Figures 1; references 31: 71 Russian, 14 Western
[195-6508/12223]

UDC: 579.252.5

PLASMIDS OF CYANOBACTERIUM SYNECHOCYSTIS SP. 6803

Moscow MOLEKULYARNAYA GENETIKA, MIKROBIOLOGIYA I VIRUSOLOGIYA in Russian
No 8, Aug 85 (manuscript received 6 Feb 85) pp 19-21

YELANSKAYA, I. V., BIBIKOVA, M. V., BOGDANOVA, S. L., KOKSHAROVA, T. A., AGAMALOVA, S. R., NIKITINA, Ye. I. and SHESTAKOV, S. V., Department of Genetics and Selection, Biological Faculty, Moscow State University, imeni M. V. Lomonosov

[Abstract] The plasmid DNA of synechocystis 6803 is described and a plasmid is described which can be used as the basis for construction of vector molecules for this cyanobacterium. Plasmid DNA was extracted from the cells of Synechocystis 6803 from a 41 7-day culture by the method of Van den Hondel, et al. The plasmid DNA was treated with restriction endonucleases by the usual method and gel electrophoresis was performed in 0.8 percent agarose. The plasmid DNA was abstracted by electrophoresis in agarose gel. Plasmid DNA was studied with en electron microscope. Several experiments were performed on isolation of plasmids in a CsCl-EB density gradient. Preliminary restriction analysis indicated that large plasmids have a greater number of recognition sites for various restriction endonucleases. In spite of the absence of unique sites for the restrictases used, the plasmid pSS2 is apparently a good basis for construction of vectors capable of autonomous replication in the cells of synechocystic 6803. Figures 3; references 11: 3 Russian, 8 Western.
[195-6508/12223]

UDC 579.252.5.04:546.33'226

LOCALIZED MUTAGENESIS OF TETRACYCLINE GENE IN PLASMID pBR322 BYSODIUM BISULFITE IN VITRO

Moscow MOLEKULYARNAYA GENETIKA, MIKROBIOLOGIYA I VIRUSOLOGIYA in Russian No 8, Aug 85 (manuscript received 26 Oct 84) pp 21-26

UGAROV, V. I., ZUYEV, A. V., REBENTISH, B. A., and KRIVISKY, A. S., All-Union, Scientific Research Institute of Genetics and Selection of Commercial Microorganisms, Moscow

[Abstract] The development of methods of localized mutagenesis is quite significant both for determination of the structure and functions of the genes and for the production of new plasmid and phage vectors. The difficulty of localized preselected mutations makes it necessary to create new and improved methods of localized mutagenesis. Sodium bisulfite ($NaHSO_3$) has been used for the production of site specific mutations in vitro in the DNA of various viruses and plasmids. The plasmid pBR322 was isolated from the plasmid-containing E. Coli strain W3110 with subsequent purification in a cesium chloride gradient. The restrictases BamHI, HindIII, PstI and BspI were used. After mutagenic processing of the restricted form of DNA pBR322 and ligation, cells of E. Coli C600 were transformed. Mutants were selected by the characteristic of sensitivity to tetracycline. The yield of mutant clones was quite high. The yield of mutants after transformation of the restricted form of plasmid DNA was quite low, some 100 times less. The yield of mutants at the Hind III site was 2-2.5 times greater than at the BamHI site, possibly as a result of different locations at the sites of the non-complementary GU pairs formed by deamination of cytosine to uracyl by the $NaHSO_3$ and subsequent ligation. Mechanisms of possible formation of mutations in vivo after bisulfite mutagenesis of plasmids are discussed. Figures 4; references 10: 3 Russian, 7 Western. [195-6508/12223]

UNIVERSAL FLU VACCINE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Dec 85 p 4

Lagovskiy, V., Correspondent

[Abstract] The article records comments of Doctor of Medical Sciences R. Khaitov, deputy director of the Institute of Immunology of the USSR Ministry of Health regarding progress of work which he and his colleagues are doing on a new-generation vaccine which would be effective against all influenza viruses.

Explaining that the effectiveness of existing vaccines is limited by the highly changeable nature of the influenza virus, Kaitov reports that a tiny protein site which is identical in the membrane of any virus was found to produce a causative agent of influenza in all of its mutations. This protein is not an immunogen, however. Khaitov, his colleagues and Academician R. Petrov believed that an immunogen could be created by attaching this virus protein to a molecule of a substance that would initiate lymphocyte reactions to the protein.

Khaitov goes on to relate that experiments by associates of Moscow State University's chair of macro-molecular compounds demonstrated that poly-electrolytes--water-soluble synthetic polymers--possess a number of advantages for this purpose. The experiments were conducted under the direction of V. Kabanov, corresponding member of the USSR Academy of Sciences. A molecule of such a polymer was attached to the virus protein. Mice were inoculated with the product. The animals were then infected with an influenza virus that is deadly to mice. The inoculation proved effective immediately. Mice thus inoculated also recovered from infection with seven other strains of influenza virus.

With regard to prospects for massproducing a universal influenza vaccine, Khaitov notes that virus proteins suitable for this purpose can be synthesized from certain amino acids. Results of recent experiments by his group indicate that these proteins perform as well as natural ones. The group has developed an experimental preparation consisting entirely of artificial molecules which is said to be the first of its kind in the world. Khaitov mentions in conclusion that the group is now preparing an experimental vaccine for tests on humans.

FTD/SNAP
/12223
CSO: 1840/244

UDC: 576.311.1

CHANGE IN ACTIVITY OF PEROXIDATION OF BIOMEMBRANE LIPIDS OF IMMUNOCYTES AND HEPATOCYTES OF MICE UPON ADMINISTRATION OF LOW-MOLECULAR-WEIGHT IMMUNOMODULATORS

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 9, Sep 85 (manuscript received 18 Feb 85) pp 65-68

GALKIN, B. N., ANDRONATI, S. A., Corresponding member, UkSSR Academy of Sciences, FILIPPOVA, T. O., GOLOVENKO, N. Ya., SOROKA, S. F. and LITVINOVA, L. A., Physical Chemistry Institute, Ukrainian SSR Academy of Sciences, Odessa

[Abstract] A study was made of the influence of low-molecular-weight immunomodulators on peroxidation of lipids in various types of cells. The experiments utilized male mice. Hemocytes, splenocytes, macrophages and hepatocytes were removed and the intensity of peroxidation of lipids determined by the quantity of malonic dialdehyde. The incubation medium was a tris-HCl buffer containing KCl. Spontaneous oxidation, NADPN-dependent and ascorbate-dependent peroxidation of lipids were determined in all cells. Tyloron, IS-22 and IS-24 do not change or reduce oxidation activity in splenocytes, whereas IS-16 and IS-30 increase the rate of formation of malonic dialdehyde. The intensity of spontaneous peroxidation of lipids is significantly increased, by a factor of 5-6. Tyloron, IS-22 and IS-24 increase spontaneous oxidation by 25-75%, IS-16 and IS-30 decrease it by a factor of 1.7. Peroxidation can therefore be considered a mechanism which mediates the effect of immunopharmacologic substances. References 11: 9 Russian, 2 Western. [084-6508/12223]

UDC 577,57.083.36

BIOSYNTHESIS OF PROTEIN AND NUCLEIC ACIDS IN CELLS TREATED WITH SYNTHETIC INTERFERON INDUCERS

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 85 (manuscript received 22 Nov 84) pp 58-59

ACHILOVA, G. Sh., BAKHRITDINOVA, M., AUYELSEKOV, S. A. and ASLANOV, Kh. A., Tashkent Order of the Labor Red Banner State University imeni V. I. Lenin

[Abstract] Biosynthesis of protein and nucleic acids in primary trypsinized fibroblast cells of chick embryos was studied after treatment with chemical compounds exhibiting interferon inducing activity. Inhibition of protein biosynthesis was observed during the first 2 hrs of incubation, which was characteristic of natural polyphenols and their synthetic derivatives. Figures 2; references: 3 (Russian).
[205-7813/12223]

UDC 612.419.017.1.015.31:577.112.5

MYELOPEPTIDES: STRUCTURE AND FUNCTION

Moscow IMMUNOLOGIYA in Russian No 4, Jul-Aug 85 (manuscript received 23 Nov 84) pp 5-7

MIKHAYLOVA, A. A. and ZAKHAROVA, L. A., Institute of Immunology, USSR Ministry of Health, Moscow

[Abstract] A new class of peptides, produced in bone marrow, the so called myelopeptides, was discuvered in recent years. These mediators of the immune system regulate the influence of bone marrow on the activity of B-lymphocytes, the agents responsible for the formation of antibodies. Analyses of various studies are summarized in this paper, reviewing structure and functional activity of these mediators. The review covers two subtopics: "Nature and properties of bone marrow stimulator of antibody producers": --limited success in puryfying it and isolating a single compound led to conclusion that it consists of several peptides, is relatively stable to elevated temperature and that it intensifies immune response in animals. The second topic "Opiate activity of bone marrow peptides" notes that, in addition to the stimulation of antibody formation, these peptides affect activity of blood forming cells and the cytolytic activity of T-killer cells. More recently these peptides were identified with an endorphin-like effect reducing reaction to pain. This analgesic action could be reversed by morphine antagonists. The relationship between these two activities remains unclear. Figures 2: references 27: 21 Russian, 6 Western (5 by Russian authors).
[229-7813/12223]

UDC 616-006.441-092.9:612.112.94.017.4]-078.73

INTERLEUKIN-2 INDUCED LYMPHOCYTE CYTOTOXICITY AGAINST SYNGENEIC LYMPHOMA EL-4 CELLS IN PRIMARY MIXED LYMPHOCYTE CULTURE

Moscow IMMUNOLOGIYA in Russian No 4, Jul-Aug 85 (manuscript received 5 May 83) pp 30-33

MITSKEVICH, P. B., MURZENOK, P. P. and VOYTENOK, N. N., Belorussian Scientific Research Institute of Blood Transfusion, Minsk

[Abstract] Interleukin-2 (IL-2) secreted by T-lymphocyte helper cells during recognition of allogeneic or modified syngeneic Ia-antigens of histocompatibility are necessary for development of T-cellular immune response. The following tasks were attempted in this work: stimulation of primary immune response in mixed lymphocyte culture (MLC) of mice splenocytes by means of exogenous IL-2; investigation of the cytotoxic activity of immune lymphocytes after primary MLC and after cultivation of immune lymphocytes in presence of IL-2. The first task was successful and formation of immune lymphocytes cytotoxic against syngeneic lymphoma EL-4 cells was induced in non-immune mice B6 using IL-2. Intensified activity and specificity of immune cytotoxic lymphocytes was manifested after their restimulation in a secondary MLD with EL-4 cells. Cultivation of immune cytotoxic lymphocytes in presence of IL-2 and "feeder" cells for 2 weeks increased their quantity and preserved the specificity of their toxic reaction. Figures 2; references 17: 3 Russian, 14 Western.
[229-7813/12223]

UDC 615.371:579.862.1].015.46.076.9

COMPARATIVE STUDY OF M-PROTEIN VACCINES IN MONKEYS

Moscow IMMUNOLOGIYA in Russian No 4, Jul-Aug 85 (manuscript received 10 May 83) pp 49-52

DZHIKIDZE, E. K., VOSKANYAN, N. A., KELLER, V., KYUNEMUND, O., KNOL, Kh., MAGAKYAN, H. I. (deceased) and KRYLOVA, R. I., Scientific Research Institute of Experimental Pathology and Therapy, USSR Academy of Medical Sciences, Sukhumi; Central Institute of Microbiology and Experimental Therapy, GDR Academy of Sciences, Jena [East Germany]

[Abstract] During recent years, the usage of M-proteins from β hemolytic streptococci for immunization against streptococcal infections is being widely disucssed. Comparative evaluation of the protective action of two different M-protein vaccines prepared from β-hemolytic streptococcus group A, serotype I was reported. Experiments were done on macaca Rhesus monkeys receiving a 4 sc-injection cycle of M-protein (one group received the protein after phagolysis extraction and purification by ion exchange chromatography, the second received this agent after further purification by immunochromatography). Experimental data showed high protective activity of the first vaccine which was still contaminated with peptidoglycan and erythrogenic toxin; the latter evidently produced the immuno-stimulating effect. References 10: 2 Russian, 8 Western.
[229-7813/12223]

UDC 618.14-006.6-085:615.277.3 Thymalin

THYMALIN IN COMBINED THERAPY OF UTERINE CANCER

Leningrad VOPROSY ONKOLOGII in Russian Vol 31, No 8, Aug 85
(manuscript received 9 Jan 85) pp 56-61

BAKHIDZE, Ye. V., BOKHMAN, Ya. V., KHAVINSON, V. Kh. and MOROZOV, V. G.,
Order of the Red Banner of Labor Scientific Research Institute of
Oncology imeni Professor N. N. Petrov, USSR Ministry of Health, Leningrad

[Abstract] Thymalin has been recommended by the Pharmacology Committee of the USSR Ministry of Health for clinical use as an immunomodulating agent in 1981, and presently employed in the management of 21 cases of uterine carcinoma in stage I. Control data were derived from 22 healthy control subjects and 25 patients with uterine carcinoma treated without the use of thymalin. Immunological monitoring of the effects of thymalin employed in conjunction with conventional chemo- and hormone therapy showed that administration of 10 mg of thymalin i.m. for 5-7 days (for a presurgical dose of 50-70 mg) exerted an effect on the T cells in some cases. In patients with depressed T cell counts and function both parameters were improved. In vitro testing further showed that thymalin stimulated the theophylline-resistant population of T lymphocytes representing the T helper cells. The use of thymalin for preoperative enhancement of the immune system was followed by inflammatory postoperative complications in only 8.7% of the experimental subjects, as opposed to an incidence of 31% in the non-thymalin group.
References 12: 7 Russian, 5 Western.
[219-12172/12223]

UDC 621.373.826:61

STUDY OF PHOTOABLATION OF ATHEROSCLEROTIC PLAQUES BY LASER RADIATION

Moscow KVANTOVAYA ELEKTRONIKA in Russian Vol 12, No 10, Oct 85
(manuscript received 20 May 85) pp 1991-1993

ABILSIITOV, G. A., BELYAYEV, A. A., BRAGIN, M. A. VELIKHOV, Ye. P., ZHDANOV, V. S., KARU, T. Yu., LETOKHOV, V. S., RAGIMOV, S. E., RUDA, M. Ya., TRUBETSKOY, A. V., FURZIKOV, N. P. and CHAZOV, Ye. I., Scientific Research Center of Technological Lasers, USSR Academy of Sciences; Institute of Experimental Cardiology; All Union Cardiological Scientific Center, USSR Academy of Medical Sciences, Moscow

[Abstract] Atherosclerotic injury of the blood vessel system is often responsible for disorders in blood supply to various organs and tissues. Laser angioplastics is one of the newer surgical techniques for correcting atherosclerotic complications. Preliminary results are reported of the study of the mechanism of plaque destruction products by laser irradiation. Experiments were performed on arterial segments from various locations, irradiated in water, in air or in vacuum, using the wavelengths of 308, 339 and 1078 nm. With Nd-YA$1O_3$ laser beam, the destruction was of an "explosive nature". Irradiation with XeCl laser led to "soft" removal of tissue without charring. Scientific ablation energy in air was 1.1 ± 0.3 kJ/g and the effective quantum yield for volatile products was 0.8 ± 0.3. Analysis of the data led to conclusion that photochemical mechanism was the basis for ablation of atherosclerotic plaques by Xe-Cl laser irradiation. Figures 2: references 12: 2 Russian, 10 Western.
[210-7813/12223]

UDC 717.735-085.849.19

RED KRYPTON LASER COAGULATION OF SUBRETINAL NEOVASCULAR MEMBRANES

Moscow VESTNIK OFTALMOLOGII in Russian Vol 101, No 4, Jul-Aug 85
(manuscript received 30 Nov 84) pp 33-36

KATSNELSON, L. A., professor, FOROFONOVA, T. I. and MAKARSKAYA, N. V., candidates of medical sciences and BALISHANSKAYA, T. I., Department of Retinal Pathology, Moscow Scientific Research Institute of Eye Diseases imeni Helmholtz

[Abstract] A comparative assessment was conducted on the efficacy of red (646 nm) krypton laser in the treatment of subretinal neovascular membranes (SNM) vis-a-vis reported effects of the use of blue (488 nm) argon laser. Analysis of the outcome obtained in the base of 53 patients (54 eyes), 16-55 years old, with SNM localized in the foveal and parafoveal areas demonstrated the superiority of this modality over the argon laser. Satisfactory visual results were obtained in 98% of the krypton laser-treated patients, with anatomical evidence of membrane resolution in 49 (91%) patients. The effectiveness of the krypton laser was attributed to its safe passage through the internal layers of the retina and absorption solely by the melanin of the pigmented retinal epithelium and the choroid. Figures 3; references 11: 11 (Western).
[1005-12172/12223]

UDC 617.7-07.681-089.168-06-085.849.19

LASER TREATMENT OF EARLY POSTSURGICAL COMPLICATIONS IN GLAUCOMA

Moscow VESTNIK OFTALMOLOGII in Russian Vol 101, No 4, Jul-Aug 85
(manuscript received 20 Feb 85) pp 14-17

ILYINA, T. S., LITVINOVA, G. G. and SHMYREVA, V. F., candidates of medical sciences, All-Union Scientific Research Institute of Eye Diseases, USSR Ministry of Health, Moscow

[Abstract] In order to minimize surgical insult to the eyeball, laser (Coherent Radiation, model 800,900) was used in the treatment of post-surgical complications in 314 patients (314 eyes). The patients were followed for 6 months to 5 years in order to assess various reconstructive (goniospasis, synechialysis, coloboma) and auxiliary (hyphema coagulation) modalities. The techniques developed at the All-Union Institute were shown in the follow-up studies to be highly effective in the management of such complications. In many cases laser intervention was followed by systemic administration of prostaglandin synthesis inhibitors and local corticosteroids to alleviate the inflammatory response. The clinical effectiveness was complemented by the low cost of the procedures and their relative simplicity. References 4 (Russian). [1005-12172/12223]

UDC 617.7-007.681-085.849.19-036.8-07:617.721-005

FLUORESCENT IRIDOANGIOGRAPHY ASSESSMENT OF IRIDIC CIRCULATION AFTER LASER IRIDECTOMY

Moscow VESTNIK OFTALMOLOGII in Russian Vol 101, No 4, Jul-Aug 85
(manuscript received 20 Feb 84) pp 17-21

PODGORNAYA, N. N., LITVINOVA, G. G. and DROZDOVA, N. M. (deceased), candidates of medical sciences, and CHAN TKHI NGUYET TKHAN, graduate student, Department of Laser Therapeutics, All-Union Scientific Research Institute of Eye Diseases, USSR Ministry of Health; Chair of Eye Diseases, First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] Fluorescent angiography was employed in conjunction with biomicroscopy in the evaluation of iridic circulation following laser iridectomy for primary closed-angle glaucoma. The study conducted on 25 patients (31 eyes) encompassed early (1-6 days) and late (1-9 years) follow-up. The study demonstrated that laser iridectomy was a sparing procedure in the treatment of this pathology, with minimal effects on the barrier function of the iris and of the ciliary body. Single-impulse iridectomy appears to be the modality of choice in the treatment of closed-angle glaucoma, as it carries the least risk of disturbing the barrier function in the anterior uveal tract. Figures 5; references 9: 6 Russian, 3 Western.
[1005-12172/12223]

UDC 617.723-006.81.04-085.849.19:311.14:312.2

SURVIVAL RATE INDICATORS IN PATIENTS WITH UVEAL MELANOBLASTOMA TREATED WITH PHOTO- AND LASER COAGULATION

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 7, 1985
(manuscript received 30 Nov 84) pp 403-407

VIT, V. V., candidate of medical sciences, and TERENTYEVA, L. S., doctor of medical sciences, Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy imeni Academician V. P. Filatov

[Abstract] Long-term follow-up studies were conducted on 357 patients treated with photocoagulation for uveal melanoblastoma to assess survival rate indicators. In the cohort, 191 patients also underwent enucleation because of the ineffectiveness of photocoagulation or because of complications. The five year mortality figure for patients subjected to photocoagulation was 11.1%, while that for the photocoagulation + enucleation was 18.2%. Photocoagulation was thus determined not to have an adverse effect on prognosis. Factors having utility in the prognosis of patient survival after enucleation (tumor size, location of anterior margin) were also applicable to patients treated with photocoagulation. Factors such as tumor volume, degree of pigmentation and patient age were without prognostic significance in patients treated with photocoagulation, as is the case in patients managed with enucleation. The fact that the mortality figure was higher in the photocoagulation + enucleation group indicates that the primary tumor site may exert a regulatory effect on the growth of metastic cells. Figures 2; references 22: 9 Russian, 13 Western.
[206-12172/12223]

UDC 59.08:599:591.1

DETERMINATION OF AIR LAYER IN FUR COAT OF SUBMERGED MAMMALS (SEAL AND VOLE)

Moscow ZOOLOGICHESKIY ZHURNAL in Russian Vol 44, No 11, Nov 85
(manuscript received 10 Sep 84) pp 1727-1732

IVLEV, Yu. F., Institute of Evolutionary Animal Morphology and Ecology imeni A. N. Severtsov, USSR Academy of Sciences, Moscow

[Abstract] A method has been devised for measuring the air layer and entrapped air in the fur coat of mammals while submerged. The essential approach utilizes the fact that water behaves as a weak electrolyte that can be used to form an electric circuit. Breaking the circuit by inserting an electrode into an air sac or layer results in a measurable voltage drop which can be correlated with the amount of entrapped air. This approach was applied to measurement of fur-entrapped air in the northern fur seal (Callor-rhincus ursinus) and the air layer in the bank vole (Arvicola terrestis). In the latter, the air layer was estimated as approximately 3.6-4.5 mm thick. Figures 5; references 6: 2 Russian, 4 Western.
[203-12172/12223]

UDC 599.742.4:591.17

HYDROSTATIC AND POTENTIAL HYDRODYNAMIC SIGNIFICANCE OF FUR-COAT-ENTRAPPED AIR OF SEA OTTER (ENHYDRA LUTRIS)

Moscow ZOOLOGICHESKIY ZHURNAL in Russian Vol 44, No 11, Nov 85
(manuscript received 3 Dec 84) pp 1754-1756

MORDVINOV, Yu. Ye., Institute of Biology of the Southern Seas, Ukrainian SSR Academy of Sciences, Sevastopol

[Abstract] Studies were conducted on streamlined flow and turbulence involved in sea otter (Enhydra lut ris) swimming to assess the hydrostatic and possible hydrodynamic importance of fur-entrapped air. Preliminary studies showed that body density of sea otters is within 0.89-0.94 g/cm^3 in June-August, with a buoyancy of +0.13 to +0.08 g/cm^3. Fur has been shown to entrap from 600 to 1800 cm^3 of air, with ca. 20-25% lost on submersion, leading to a mean air layer over the body surface of ca. 0.5 cm without taking into consideration the volume of air lost in the act of submersion. Streamlined flow prevails at velocities 0.2-0.3 m/sec (Re =(1.8 - 2.7) x 10^5) along the length of the body. With an increase in velocity to 0.5-0.6 m/sec (Re = (4.5 - 5.5) x 10^5) turbulence is seen in the laminar flow around the anterior extremities. With a further increase in speed to 1.5 cm/sec and with spurts to 2.0 m/sec (Re = (1.3 - 1.8) x 10^6) turbulence increases markedly. The extent of turbulence was correlated with the loss of air from the fur coat, with the latter showing direct correlation with velocity and the performance of maneuvers. It appears that the fur coat and entrapped air function as a damping mechanism that in the final analysis reduced swimming resistance. Figures 1; references 3 (Russian).
[203-12172/12223]

CARDIOVASCULAR DISEASE CONTROL

Moscow NEW TIMES in English No 44, Oct 85 pp 27-30

SAMOILOV, Yur , correspondent

[Text] Today cardiovascular diseases are first amongst the causes of death in the developed countries. How Soviet cardiologists are combating these diseases was described to our correspondent Yuri Samoilov by Academician EVGENI CHAZOV, Deputy Minister of Health of the USSR and Director of the USSR . Cardiology Research Center. The article is entitled Spotlight on the Heart.

New Times. The American magazine TIME recently called the USSR Cardiology Research Center "a real pearl in the crown of Soviet medicine." What do you think of this evaluation? And, more importantly, what made it necessary to found an establishment of this type?

E. Chazov. That's very flattering. But, of course, this is an acknowledgment of the fact that the health service and the progress in medical science achieved under socialism cannot be matched by any other system in the world. This of course, merits a discussion by itself, but that is how I should like to interpret the TIME comment. As for the main reason for the founding of our center, it was because the problem of cardiovascular diseases had already expanded beyond the boundaries of a purely medical framework by 1975, when the Center was planned. It had become a national problem incurring substantial losses of manpower and resources. It was necessary to organize a center that would ensure the development of cardiology through a network of specialized institutions. At present we have 15 cardiology institutes in our country, located in all the major regions. The Moscow Center was founded at what was then the Institute of Therapy. I was at one time its director. Subsequently this institute was reorganized into the Alexander Myasnikov Institute of Clinical Cardiology. Our Center also includes the Institute of Experimental Cardiology, the Institute of Preventive Cardiology, and a branch in Tomsk. During the current year a clinical department of this branch has been opened in Tyumen. The programs of these establishments include research into specific features of cardiovascular disease in the climate conditions

of Siberia, the Far East and the Far North. Our Center heads the state program for the study of these diseases, and coordinates research work at 99 establishments of the USSR Academy of Sciences, the Academy of Medical Sciences and of many ministries and governmental departments. The program includes not only research, but also many practical measures to expand cardiological services: the establishment of specialized cardiology centers, emergency ambulance services and cardiology departments in clinics.

N.T. Some years ago you said atherosclerosis was the chief problem that remained to be solved in cardiology.

E.C. This is still true. Atherosclerosis is one of the most widespread and serious of diseases. It affects the aorta, and the arteries of the heart, brain, kidneys and other internal organs and the limbs. What happens is that, as the disease progresses, what we call atherosclerotic plaques appear on the internal walls of the blood vessels. The vessels then contract and this can lead to ischemic heart disease, myocardial infarction (heart attack, coronary thrombosis), cerebral thrombosis (stroke) and other severe lesions. Statistics show that the incidence of atherosclerosis has increased dramatically in recent decades. Should no effective means of treatment be developed in the immediate future the disease may reach epidemic proportions.

N.T. The cholesterol theory of the genesis of atherosclerosis was until recently widely held. According to this theory the condition is caused by increased levels of cholesterol in the blood.

E.C. Yes, formerly it was thought that a high cholesterol level in the blood was an indication of atherosclerosis. However, it has been shown that this is not so. Attempts to prevent the onset of the disease simply by lowering the cholesterol level have not produced convincing results. In this connection I recall a story my teacher, Professor Alexander Myasnikov, used to tell. During one of his trips abroad he was invited to a royal reception. As he was helping himself to a salad containing hard-boiled eggs he was asked: "Professor, aren't you afraid of developint atherosclerosis?' Myasnikov was one of those people who are never at a loss for an answer and he immediately retorted: "It's better to have plaques in the blood vessels than a brain that doesn't work properly." This was a joke, of course, but there is some truth in it. To function adequately the brain in fact requires significant amounts of cholesterol. We now know for certain that the development of atherosclerosis is determined by two basic factors: the condition of the internal walls of the blood vessel and a disturbance in the lipid (fat) metabolism.

N.T. How do scientists see the development of atherosclerosis at present?

E.C. When the walls of the blood vessels are normal, that is intact, atherosclerosis does not, as a rule, develop. Plaques begin to form on the appearance of even the slightest lesion in the thin, delicate

layer coating the inner surface of the blood vessel. Compounds made up of fine particles of protein and cholesterol, the so-called lipoproteins, rush to the lesion. These lipoproteins have of late become an object of assiduous study in medical laboratories. It has been found that there are two types of lipoproteins circulating in the blood. Cells of one type carry the cholesterol to the vascular walls, while cells of the other type carry it away. In the healthy organism these processes are in equilibrium, that is, there is an optimal correlation between the different types of lipoproteins. Our investigations have shown that the development of the disease is not only associated with changes in this correlation, but also with the structure of the protein particles. There is a very complex and delicate interaction. In addition to the accumulation of cholesterol in the atherosclerotic plaque, the tissue of the vascular wall begins to grow. Numerous outsize cells known as stellate cells have been found in the plaques. These cells absorb cholesterol at an accelerated rate and at the same time produce connective tissue. It is probable that these comparatively rapidly dividing cells play a most important part in the formation of the atherosclerotic plaque.

N.T. In what areas are scientists now looking for methods of combating this disease?

E.C. It would be most tempting to try to block the synthesis of cholesterol in the body. However, for this we must first learn how to control the intestinal cells involved in fat metabolism, or the liver cells in which cholesterol is synthesized. Certain achievements in this area look promising. We are also working on the creation of synthetic lipoproteins capable of eliminating cholesterol from the blood in the way that natural compounds do.

And there is another way. We know that the immune reaction of the body to foreign substances is the job of special antibodies. Every antibody reacts solely to its own adversary. It is possible to obtain antibodies for any organic tissue. Let us assume the appearance of a microscopic lesion in the inner lining of a blood vessel; this lesion exposes the basic constituent of the wall--collagen. The necessary antibodies in this case can be obtained from the blood of animals immunized with collagen. These antibodies are combined with liposomes--fat vesicles--into which a special preparation has been introduced; when the resulting compound is injected into the blood it makes its way directly to the site of the vascular lesion. The antibodies, like magnetic torpedoes, find their "victims." Where the vascular wall has been damaged we can see under a microscope a mass of vesicles that have come to its defence. An important point is that these vesicles also prevent the formation of thrombi--blood clots. We hope that this will prove a reliable method for blocking the activity of the stellate cells. We have already worked out, under laboratory conditions, a number of preparations that eliminate cholesterol from these cells, obstruct their division and the production of connective tissue. You might say that we are already treating atherosclerosis by this method, but as yet only in test tubes.

N.T. How would you characterize the current phase in the development of cardiology?

E.C. In the past decade, cardiology has made rapid progress through a combination of general systemic approaches and studies of pertinent processes at cellular-molecular levels. We have succeeded in clarifying the extremely complex and delicate mechanisms of cardiovascular disease. We know today that breaks in the rhythm of the heart beat are to a considerable extent connected with a disturbance in the ionic exchange that takes place in the cells. There are minute pores in the cellular membranes, canals, through which the various ions move in and out of the cell. One square micrometer of cellular membrane can contain tens of thousands of such canals. Through each one of them thousands of millions of ions can pass in a single second. In the final analysis the functioning of the major organic systems is conditioned by the remarkably finely concerted action of the ionic canals that selectively admit, in strictly defined order, the passage of ions of sodium, potassium, calcium and other elements. The electrocardiograms so widely resorted to in medicine are actually recordings of the electric impulses produced by the cells in the coronary tissues as a result of the movement of ions through these canals. The normal rhythm of the heart depends on how fast sodium ions pass through the canals.

The search for essentially new antiarrhythmic preparations was carried out at a cellular-molecular level. Thus, Soviet pharmacologists developed ethmosin, a preparation that was tested in our Center with very good results. E.I. duPont de Nemours and Co. (USA) has acquired a license to produce it. We have also developed a very potent preparation called ethacysin. Its wide-scale use will make life easier for many patients afflicted with severe forms of arrhythmia. This preparation is at present used in the U.S.A., Japan, West Germany and Switzerland.

As a result of unique experiments we have learned that the conductor of energy in coronary cells is creatine, a substance that plays a leading role in regulating the function of the cardiac muscle. This discovery was the basis for the creation of a new preparation, which when used in heart surgery (replacement of the cardiac valves), dramatically reduces the possibility of the development of arrhythmia. Quite recently another discovery by Soviet researchers was registered. It throws new light on the causes of the development of hypertension. It turns out that an increase in arterial blood pressure is closely connected with the concentration of calcium in the cells. I think that further investigation into cardiovascular disease at a cellular-molecular level will lead to still more important discoveries.

N.T. The path of a new medicine to the patient is, as a rule, a long and difficult one. Before mass production can be permitted it must be thoroughly tested clinically. What is being done at the Center to speed up this process?

E.C. In order to test a new preparation clinically there must be an adequate supply of it, and laboratories cannot provide it. We are now setting up, under our Center, an experimental production enterprise. Although it will not replace industrial production, it can expedite the process of introducing approved medicines into general practice.

N.T. Does the Center devise new equipment and diagnostic techniques?

E.C. In recent years more than 60 instruments have been evolved at our Center. The majority of them have been approved for serial production. Thanks to built-in microprocessors in these instruments the patient can be examined swiftly, while the precision and authenticity of the data obtained increased. For instance, using our rheograph we can now carry out an examination of the circulation without taking any blood. In this we have outstripped our foreign colleagues. As a result of international cooperation a tomograph operating on the nuclear-magnetic resonance principle has been created. It projects on a screen color images of sections of the heart or brain at any depth, thus opening up new diagnostic possibilities.

N.T. Some of your instruments have travelled into outer space. In your opinion, are the frontiers of cardiology advanced by investigations conducted in outer space?

E.C. Back in 1958, problems associated with the exploration of outer space had already become a point of interest at the Institute of Therapy. At that time, our department of physiology was headed by the founder of space medicine, Academician Vasily Parin. It was then held that the most important thing to check before sending a man into orbit was the condition of his cardiovascular system. Subsequently, the Institute of Medico-Biological Problems was created; it continues the study of a wide range of subjects connected with outer space. We are also, as far as possible, continuing to work in this field: a special program has been designed at the Center. By means of our portable echocardiograph "Argument" an echocardiogram on a true time-scale was transmitted to Earth in 1982 from outer space for the first time. Very good results were also obtained with our cardiomonitor "Lenta-MT" during the orbital flight of the space crew of the Salyut-7 station in 1984. Our staff researcher Oleg Atkov carried out a number of interesting investigations there. He told me that our cardiomonitor had proved to be more reliable than its American counterpart which he had also taken along. This miniature device tape-records everything occurring in the heart over prolonger periods of time: hours, days. When such a recording is decoded by computer, the physician has a complete picture of the subject's heart function. Both instruments will have a wide application not only in space, but on Earth as well. It is most important for their manufacture to be stepped up. Timely diagnosis, effective treatment and, in the final analysis, the fates of thousands of people depend on this.

Peaceful exploration of outer space will unquestionably promote the development not only of cardiology, but of medicine as a whole, Humanity is now beginning to explore space on an increasing scale and we doctors are greatly concerned that it should become an arena of cooperation, not of confrontation. It seems to me that in these matters it would be very beneficial to set up a world organization for international cooperation in the peaceful exploration and utilization of outer space.

N.T. About thirty years ago a patient who had had a heart attack was immobilized in bed for one or two months. But now patients are in many cases ordered to get up only days after the attack. Why this complete change of methods?

E.C. Formerly doctors did not know as much as they do now about how the cardiovascular system functions during a myocardial infarction. Complete bed rest was prescribed, the patient was not permitted to move at all: God forbid the heart should burst! I shall never forget how in 1962 I paid a visit to the chief stage-manager of one of Moscow's theaters. About a month before my visit he had developed vague pains in the area of the heart. He was hospitalized and warned that if he so much as made the slightest turn in bed he would die! He lay for thirty days in bed without moving. His joints even began to atrophy.

I examined him and said: "Get up!" "Are you joking?" he answered, "I'll die!" "Get up," I said, "otherwise you will certainly die!" I do not know whether he remembers the occasion. A great deal of effort was needed at that time to overcome the inertia in the thinking of the majority of physicians! We were the first to advocate physical activity after a myocardial infarction.

An experiment was once conducted whereby a group of young volunteers spent several days in bed, without moving. In the majority, a considerable weakening of the heart developed and the activity of other organs also deteriorated. Healthy people actually became invalids! So what can be said about real patients to whom every kind of movement is forbidden? Their condition becomes even worse. Physical exercise increases blood flow, reduces congestion and improves circulation in the heart. Naturally, these exercises must be strictly individualized. Today 80 per cent of patients who have suffered heart attacks return to their usual occupations. Our system of treatment for such patients includes not only physical exercise, but also first aid, an ambulance to hospital, hospitalization for as long as necessary, and then rehabilitation--at first in the hospital and then a month in a sanatorium.

In our country a network has been set up of cardiology sanatoria and specialized departments in hospitals, where an annual 50,000 patients who have suffered acute myocardial infarction receive treatment and convalesce. As distinct from the West, where a cardiovascular patient counts his money before leaving home to see if he will have enough to pay for an ambulance if he has a heart attack, in the USSR all medical treatment, from beginning to end, is free.

When a person who has recovered from a heart attack returns to his job he is kept under constant observation at a specialized medical center or at his local polyclinic. As a result of this unremitting activity on the part of cardiologists the overall mortality rate, including deaths caused by cardiovascular diseases, has for the first time in recent decades fallen in our country.

N.T. It is generally assumed that emotional people are more prone to heart attacks than even-tempered people. Is it possible to reduce the risk for them?

E.C. It is now clear to medical researchers that stress increases the level of certain hormones in the blood, notably of norepinephrine and of catecholamines. Excessive amounts of these substances can damage the heart muscle and other organs. We have learned to allay stress very swiftly by administering certain medicines. However, such measures, in my opinion, should be resorted to only in extreme cases for stress is not always harmful. An experiment has been described in which cancer-inoculated rats were subjected to moderate emotional stress. As a result the lives of the experimental animals lengthened quite considerably. Observation shows that moderate tension in conjunction with a generally favorable psychological background improves the condition even of seriously ill patients, let alone healthy individuals. It is important to learn self-control, to develop in oneself the ability to enjoy life, not to attach too much significance to trifles, to follow an orderly regimen and to take up some type of physical exercise.

Regrettably, it must be admitted that for a very long time the prevention of cardiovascular diseases was not approached correctly by doctors. This is true not only of our country, but of the rest of the world as well. We began preventive treatment too late, whereas it should be instituted in childhood, the time when future heart diseases are generated. It has been found, for instance, that plaques can appear on the vascular walls at as early an age as 12, and 8 percent of schoolchildren have high blood pressure. But many children are not trained to have either physical or mental stamina. We try to shield them in every way from emotional upsets. Things have gone so far that cardiologists are raising the question of increasing physical exercise for schoolchildren. According to our data the physical activity of a child is reduced by 25 percent between the ages of 10 and 15. When he is small the child runs and jumps, and kicks a ball around the yard. But as soon as he starts school all this fun stops. Now he sits all day at his desk at school, at the table at home. So it is hardly surprising that at the age of 15 there are so many young "old men."

In general, Soviet doctors are in favor of a healthy way of life for both children and adults. For this purpose we have advanced an integrated program of primary prophylaxis. Currently it is usual for oncologists to promote their own preventive measures, for gastroenterologists and cardiologists to advise theirs, so the patient gets the most diverse recommendations. We hold that all the recommendations should be integrated,

and on their joint basis a single complex of measures should be devised to help a person stay healthy. Smoking, for example, is harmful not only to the heart, but to the lungs and the stomach as well.

N.T. What about alcohol? Some people think that its danger in regard to the development of cardiovascular diseases is somewhat exaggerated.

E.C. No, the danger is not exaggerated at all. Do you know that approximately 25 per cent of the people who drink alcoholic beverages in moderation die suddenly, in seemingly good health? Frequently this is due to a breakdown in the rhythm of the heart beat. In the USA, for instance, something like 400,000 sudden deaths occur annually. More than one third of these people are found to have recently passed a medical examination that revealed no precursors of the impending disaster. A similar thing is observed in other developed countries as well. Sudden death, as a rule, overtakes men, often at the age of 35-40. The prevalent cause of such death is fibrillation--a chaotic twitching of the heart muscle. The heart stops pumping the blood. In 10-15 minutes, if no aid is given, irreversible changes take place in the brain and the person dies. Soviet and American researchers have made more progress in the study of this phenomenon than any other researchers. We have been cooperating for the last 13 years in the study of this and of other cardiological problems. Our cooperation is progressing successfully to our mutual benefit. We do not duplicate each other's investigations, we either exchange for resulting data or work together. So high has the cost of the study of many problems become in our time that continued research is possible only through active international cooperation.

N.T. My final question, if you will permit it, is associated with your public activities. Tens of thousands of people die every day from heart failure, but nuclear war threatens to take away hundreds of millions of lives in a trice. How are man and humanity to be saved from this?

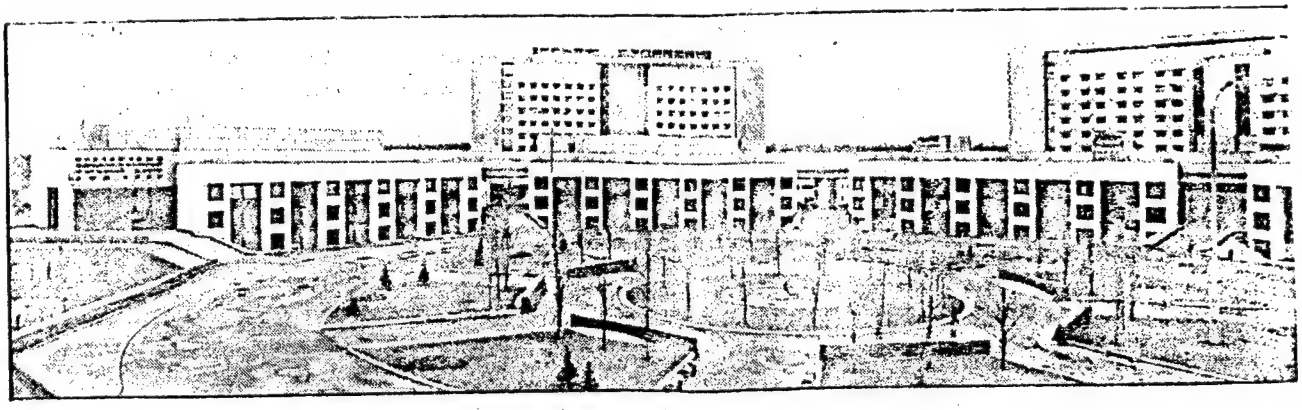
E.C. Yes, indeed, the destructive power of the nuclear weapons that have been stockpiled is equivalent to more than a million of the bombs dropped on Hiroshima and Nagasaki in 1945. Many years have passed since then, but I still cannot understand how it was possible to doom tens of thousands of perfectly innocent people to instantaneous death in a nuclear holocaust! Many of the survivors are still dying from the consequences of that atomic attack.

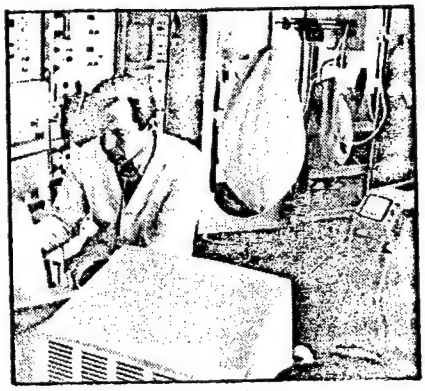
How profound Sophocles' words are today! Greek tragedian said: "How terrible reason can become if it does not serve mankind." Today the most important task facing the human race is the defence of peace on Earth, the struggle to stop the arms race. The funds thus released should then be spent on solving urgent problems. According to U.N. data, 40,000 children in the developing countries die every day of hunger and disease, 570 million people are undernourished, and medical services are practically unavailable for 1,500 million people.

Several years ago, when the American cardiologist Bernard Lown and I were discussing the problem of sudden death, we had the idea of making people the world over aware of what nuclear war would entail. In 1980 physicians from various countries got together in Geneva and decided to found a movement called International Physicians for the Prevention of Nuclear War. This purely professional movement disregards ideological differences. In the following year the first congress of this organization was attended by representatives from 11 countries. Today the movement includes something like 15,000 physicians from about 50 countries. As you must know, the International Physicians for the Prevention of Nuclear War movement was recently awarded the Nobel Peace Prize for its activities.

Our main thesis is: should nuclear was break out nothing would save mankind from destruction. Any "limited" nuclear war will immediately expand into a global war in which there will be no victors. Even the doctors who survive it will be unable to do anything, while the long-term consequences of the nuclear explosions will affect all future generations. Physicians have dispelled the myth of the "humane nature" of the neutron bomb. The results of our investigations were forwarded to the World Health Organization, by whom our movement has been acknowledged, although it is nongovernmental. At out latest congress, held last June in Budapest, we demonstrated, in figures, how much humanity loses as a result of the arms race--a daily $2,200 million. Meanwhile, a mere $250 million would suffice to vaccinate all the children on our planet. An important step towards stopping the arms race could be made by other states if they joined the Soviet moratorium on nuclear weapon tests. We of the medical profession hold that nuclear war can be averted.

Photos on following page.





The U.S.S.R. Cardiology Research Centre in Moscow.

[photos included in the article show 1) a picture of apparently, Chasov; 2) The USSR Cardiology Research Center in Moscow; 3) An interior laboratory of the latter.

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CSO: 1840/221-E

RED BLOOD CELL STUDY CLUB

Moscow KHIMIYA I ZHIZN in Russian No 8, Aug 85, p 16-21

[Article by MARKIN, V.S., doctor of physical-mathematical sciences, "Such a Beautiful Cell: 200 Years in Search of a Mystery"]

[Abstract] The Red Blood Cell Club is a club without a clubhouse, a loosely organized collection of European workers studying erythrocytes. The Club has no permanent address, nor permanent members. Each two years its members meet, always in a different place, to present their latest research results. One of the major mysteries of the red blood cell is how it maintains its characteristic shape, a disk with depressions on both sides. The erythrocyte is an envelope structure with no internal skeleton, the envelope independently maintaining the double concave shape characteristics of the cell. Experiments have proven that the cell membrane is uniform, so that the shape cannot be explained by differences in thickness or composition of the envelope. The thermodynamic theory of cell shape maintenance was very attractive, until it was discovered that the applicable equations would naturally lead to a different shape. The Club continues to search for the answer to this puzzling mystery.
[088-6508/12223]

ADVANCES IN LASER MEDICINE

Moscow TRUD in Russian 13 Nov 85 p 4

KRIVOBOKOV, E., TRUD correspondent, Alma-Ata

[Abstract] The red light of helium-neon lasers is continuing to find many uses in medicine, which is not surprising to V. V. Inyushin of the Kazakh State University. He notes that, after all, the red part of the solar spectrum that is absorbed by plants and shows the basic physiological activity is after all, that on which all life depends. In Alma-Ata, medical researchers, such as P. R. Chekurov and M. Aliyev, have seen its effectiveness in accelerating the healing of surgical incisions, leading to earlier patient discharge, as well as in improving the quality of artificial blood substituents simply by irradiation of the substituent. Although there are about a 100 laser treatment facilities in Alma-Ata, the number is felt to be inadequate. There is also an evident need for a laser research center in Alma-Ata, to concentrate on a therapeutic modality that is now gaining adherents in other countries (West Germany, USA, Bulgaria, Hungary, Sweden) as well.
[185-12172/12223

PORTABLE MAMMOGRAPHY INSTRUMENT

Moscow PRAVDA in Russian 24 Nov 85 p 2

SENIN, V., "PRAVDA" correspondent, Leningrad

[Abstract] Since the implementation of a quality-circle concept at the Scientific Industrial Complex of Radiology Instruments of the Svetlana Association, production and morale have both gone up shaply. V. Bogdanov, head of the Complex at Svetlana, explained that it was only a matter of months from the planning stage to production of a portable mammography machine that has received international acclaim. Quality circles were created to bring research findings into production and to stimulate greater efficiency and reliability, with an annual increase in productivity of 9-10%. This rate of increase is expected to be maintained in the 12th Five Year Plan, and the Svetlana experience can serve as a model for other scientific-industrial associations.
[187-12172/12223]

EMOTIONS AND HEALTH

Leningrad LENINGRADSKAYA PRAVDA in Russian 16 Nov 85 p 6

MANILOVA, Zh.

[Abstract] V. S. Rotenberg, scientists with the Laboratory of Psychophysiology and Psychodiagnostics of the First Moscow Medical Institute, has elucidated some of the emotional factors that are important in human health. It is now generatlly accepted that biopsychosocial factors are important in many psychosomatic disorders, one of which is cancer, and that stress is one of the key ingredients. The attitude of an individual is also of key importance. A passive attitude more often than not leads to further deterioration, whereas a positive attitude of 'not giving in' frequently is accompanied by abatement of the underlying pathology. Few today would question the importance of mental health in the overall health status of an individual.
[190-12172/12223

UDC 616.345-006.6-037(478.9)

COLORECTAL CANCER: INCIDENCE AND PROGNOSTICATION IN MOLDAVIAN SSR

Leningrad VOPROSY ONKOLOGII in Russian Vol 31, No 6, Jun 85
(manuscript received 23 Feb 84) pp 86-90

KHONELIDZE, G. B., KOSHCHUG, S. D. and BELEV, N. F., Moldavian Scientific Research Institute of Oncology, Kishinev

[Abstract] In the Moldavian SSR, cancer of the rectum is seventh among all cancers. While colon cancer is eighth; in terms of gastrointestinal tumors they rank second and third respectively. Analysis of the data for the period of 1965--1979 showed that incidence of rectal cancer increased 3.5 fold; during 1970--1977 the incidence of colon cancer increased 1.4 fold and that of the large bowel--1.7 fold. Among men, the increase was 4.3 $o/_{oooo}$ and among women it was 3.2 $o/_{oooo}$. Cancer of the large bowel is a frequently-occuring malignancy in Moldavia with a tendency towards further increase. Based on the current dynamics, a projection was made that by 1990 the large bowel cancer incidence will exceed that of the stomach and will rank one of the top tumors of the digestive tract. References 15: 10 Russian, 5 Western.
[216-7813/12223

UDC 616-006-089.5:615.84

TRANSCUTANEOUS ELECTROSTIMULATION: EFFORT AT CONTINUOUS ELECTROANALGESIA IN ONCOLOGY

Leningrad VOPROSY ONKOLOGII in Russian Vol 31, No 8, Aug 85
(manuscript received 15 Jan 85) pp 33-36

DILDIN, A.S., TIKHONOVA, G. P. and KOZLOV, S. V., Kuybyshev Medical Institute imeni D. I. Ulyanov, RSFSR Ministry of Health

[Abstract] Transcutaneous electrostimulation was tested for analgesic effects in 94 oncologic patients, including 29 patients in whom the procedure was used intraoperatively as a component of general anesthsia, 54 treated for postoperative pain, and 11 with advanced disease. The electrodes from ELIMAN-101 current generator were placed in paravertebral locations in accordance with segmentary innervation of pain source, delivering right angle pulses (180-200 Hz, 35-50 mA for 45-60 min/session). Analgesia persisted for 1.5-3.5 h after a treatment. Use of electrostimulation intraoperatively reduced the use of fentanyl 2.4 fold. Postoperatively electrostimulation completely abolished pain in 65.5% of the patients, while 34.5% required additional non-narcotic analgesics. Electrostimulation was also found to be effective in chronic pain and led to 6-fold reduction in the need for opiates. Finally, in the trials conducted, there was no evidence of lessened effectiveness with time due to accomodation or adaptive phenomena.
References 7: 6 Russian, 1 Western.
[219-12172/12223

UDC 617.741-007.21-089

LONG-TERM WORK FITNESS AFTER IMPLANTATION OF INTRAOCULAR LENSES

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 7, 1985
(manuscript received 3 Dec 84) pp 411-414

KRYZHANOVSKAYA, T. V., senior scientist, and LOGAY, I. M., doctor of medical sciences, Dnepropetrovsk Scientific Research Institute of Invalid Rehabilitation of Work Fitness Expertise; Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy iemi Academician V. P. Filatov

[Abstract] Long-term follow-up on 70 patients with intraocular lens implantation over a 2-10 year period, 55 of whom were engaged in heavy physical labor, demonstrated that deterioration in vision was unrelated to the type of work performed. In view of this, additional evaluation was performed on 100 individuals with intraocular lenses to determine the effects of head and body position and inclination, body vibration, and measured physical loads on the status of the lens and its supportive elements. The particular risk factors for individuals with implanted lenses were identified as lens mobility, deformed pupils, shallow anterior chamber, fibrosis of lens-supportive elements, delayed post-surgical recovery of intraocular pressure, etc. As a result, work-related factors that would place individuals with intraocular lenses into a high-risk category were identified as tasks requiring prolonged inclination of the head and/or trunk, inertial and proclinational loads, and those-inducing nystagmoid eye movements. Figures 3; references 11: 10 Russian, 1 Western.
[206-12172/12223]

UDC 617.741-089.87-77-089.168.1

CLINICAL COURSE AND POSTSURGICAL MANAGEMENT FOLLOWING CATARACT EXTRACTION AND INTRAOCULAR LENS IMPLANTATION

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 7, 1985
(manuscript received 24 Jan 85) pp 415-417

SERGIYENKO, N. M., professor, and VESELOVSKAYA, Z. F., candidate of medical sciences, Chair of Eye Diseases, Kiev Institute for the Advanced Training of Physicians; Kiev Scientific Research Institute of Clinical and Experimental Surgery

[Abstract] An analysis was conducted on the linical course and management problems of 500 cases with Sergiyenko-type intraocular lenses. In the period 1983-1984, the severity of postsurgical inflammation was attributed to intrasurgical complications in 5% of the cases, while no such antecedents were discerned in the remaining cases. In terms of clinical manifestations, the postsurgical inflammatory reactions were classified into early (1-5 days after the operation) and late (2-4 weeks after the operation). The clinical features of the various inflammatory reactions and their preferred treatment are summarized in tabular form. One of the more important factors in the treatment of postsurgical uveitis was the construction of the implanted lens, which allowed for ready dilatation of the pupils. References 14: 11 Russian, 3 Western.
[206-12172/12223]

UDC 615.5-006.443-091

HISTOPATHOLOGY OF KAPOSI'S SARCOMA

Moscow ARKHIV PATOLOGII in Russian Vol 47, No 11, Nov 85
(manuscript received 30 Oct 84) pp 75-80

KAZANTSEVA, I. A., KALAMKARYAN, A. A. KERIMOV, S. G. and KARELINA, T. V., Central Pathoanatomic Laboratory, Institute of Human Morphology, USSR Academy of Sciences; Central Skin-Veneral Institute, USSR Ministry of Health

[Abstract] A histologic analysis was conducted on skin biopsies obtained from 45 patients with Kaposi's sarcoma (KS), the cohort consisting of males and females 24-89 years of age. The lesions, beginning generally in mid-dermis and extending to the epidermis, were characterized by chaotic angiogenesis and spindle cells in the hematoxylin/eosin-stained sections, and remarkably atypical nuclei. Although these features constitute key diagnostic points, these manifestations and nodular features in early cases as well as in long-term pathology are insufficient for a diagnosis on histologic grounds. For definitive diagnosis the histopathologic findings have to be repeat biopsies. In addition, the presence of spindle cells and the degree of anaplasia of the spindle component appear insufficient for prognostic predictions. Figures 3; references 12: 3 Russian, 9 Western.
[202-12172/12223

UDC: 577.175.14:579.841.11.013

SOME PROPERTIES OF MICROBIAL CYTOKININS FROM PSEUDOMONAS STUTZERI

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85
(manuscript received 20 Feb 84) pp 774-777

MISHKE, I. V., TEVELEVA, M. K. and MIKLASHEVICHS, E. P., Institute of Microbiology imeni A. Kirkhenshteyn, Latvian SSR Academy of Sciences, Riga

[Abstract] Cytokinins (phytohormones) regulate the genetic apparatus, structure and functional composition of the cell. The purpose of this work was to isolate, purify and study a number of the physical-chemical properties, and also undertake biological testing, of cytokinin compounds isolated from pseudomonas stutzeri culture fluid. The strain pseudomonas stutzeri 136 was used. The cultivation was performed in 750 ml flasks containing 250 ml nutrient medium, with purines removed from the supernatant of the culture fluid every twenty-four hours. UV spectroscopy, gel filtration and thin layer chromatography were used to study the purines. It was shown that P. stutzeri 136 produces active cytokinin compounds differing from those previously studied in a number of respects. Figures 5; references 12: 6 Russian, 6 Western.
[196-6508/12223]

UDC: 582.282.23.017.7:577.152.1

ACTIVITY OF ENZYMES OF TRICARBOXYLIC ACID CYCLE AND ANAPLEROTIC PATHS IN VARIOUS STRAINS OF CANDIDA LIPOLYTICA UPON GROWTH ON GLUCOSE AND HEXADECANE

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85
(manuscript received 21 Feb 84) pp 735-739

YERMAKOVA, I. T., ILLARIONOVA, V. I. MELNIKOVA, O. F., SHISHKANOVA, N. V. and FINOGENOVA, T. V., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] This work continues a series of investigations studying the specifics of oxidative metabolism of yeast in the genus candida when grown on various carbon sources. The activity of enzymes in the cells of a natural strain and its two mutants is analyzed under identical conditions with constant pH and constant oxygen concentration, providing the maximum specific growth rate of each strain. The natural strain C. lipolytica 704 and two mutants with altered isocitrate lyase were studied. A table presents the activities of key enzymes in the tricarboxylic acid cycle, glyoxylate cycle and pyruvate carboxylase in the three strains in both media. All strains had high citrate-synthase activity. All strains had approximately equal NAD-isocitrate dehydrogenase activity. Mutant 1 had high isocitrate lyase activity on glucose and low pyruvate carboxylase activity, indicating simultaneous functioning of the glyoxylate path and pyruvate carboxylase on glucose. The natural strain and mutant 1 had high isocitrate lyase activity on hexadecane, indicating the importance of the glyoxylate path as an anaplerotic pair under these conditions. Under these same conditions, mutant 2 grew well on hexadecane without isocitrate lyase but with high malate synthase activity, indicating functioning of a different anaplerotic path of synthesis of C_1 intermediates.
References 10: 6 Russian, 4 Western.
[196-6508/12223]

UDC: 579.841.11.017.7

REGULATION OF SYNTHESIS OF KEY NAPHTHALENE CATABOLISM ENZYMES IN PSEUDOMONAS PUTIDA AND PSEUDOMONAS FLUORESCENS CARRYING BIODEGRADATION PLASMIDS NAH, pBS3, pBS2 and NPL-1

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85
(manuscript received 17 Feb 84) pp 755-762

STAROVOYTOV, I. I. Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] A study was made of the regulation of catabolism of naphthalene in pseudomonada containing the biodegradation plasmids mentioned in the title. Bacteria were grown on a minimal medium. Induction experiments were performed on a circular rocking device in 750 ml flasks containing 100 ml of medium. Salicylic acid is found to induce key naphthalene catabolism enzymes controlled by the NAH plasmid.. Of the key enzymes controlled by NAH plasmid, the synthesis of naphthalene oxygenase and salicylate hydroxylase is regulated in a coordinated manner, indicating that these enzymes are included in a single regulatory unit. The presence of proportionality in changes in specific activities of salicylate dehydroxylase and K02,3 with induction by salicylate, anthranylate and 3-methylsalicylate indicate that the synthesis of these enzymes is regulated in coordination. The differences in coordination of regulation of the synthesis of naphthalene catabolism enzymes in microorganisms belonging to the same genus and even species probably reflects an independent evolution of the genetic material. The genetic environment of the host cell probably also influences expression of the plasmids. Figures 5; references 15: 6 Russian, 9 Western.
[196-6508/12223]

UDC: 579.842.11.087:537.3

STUDY OF CHANGE IN ELECTROORIENTATION OF ESCHERICHIA COLI CELLS UPON EXPOSURE TO DISINFECTANTS

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85
(manuscript received 27 Feb 84) pp 826-829

IVANOV, A. Yu., DEYNEGA, Ye. Yu., MIROSHNIKOV, A. I. and SAVLUK, O. S.,
Institute of Biological Physics, USSR Academy of Sciences, Pushchino

[Abstract] The purpose of this work was to determine the mechanism of action of disinfectants in order to seek means of controlling the process of decontamination of water. The electroorientation effect of Escherichia coli cells was studied on exposure to such substances as sodium hypochlorite and silver nitrate as well with thermal inactivation. The results showed that a study of the frequency variation of electroorientation effect of bacterial suspensions by a turbidimetric method not only can monitor changes in electric surface properties of cells, but also yield new information on other structural cell elements, revealing disruption of the barrier properties of membranes with respect to disinfectants. Cell inactivation is manifested in these studies as a decrease of electroorientation effect with increasing frequency at 10^5-10^6 Hz. Figures 2; references: 5 (Russian).
[196-6508/12223]

UDC: 631.46:582.282.23.017.7:550.72

BIODEGRADATION OF PETROLEUM HYDROCARBONS IN SOIL INOCULATED WITH YEAST

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85
(manuscript received 30 Jan 84) pp 835-841

ISMAILOV, N. M., Microbiology Sector, AzSSR Academy of Sciences, Baku

[Abstract] Recent studies have indicated high catabolic activity of Candida and Torulopsis yeast for aromatic hydrocarbons. This work presents laboratory and field studies of conditions of decomposition of crude oil and aromatic hydrocarbons in soil inoculated with yeast cultures of the genera Candida and Torulopsis. Simultaneous addition of microorganisms and hydrocarbons to soil was found to intensify its respiration. The intensity of decomposition of petroleum in yeast-inoculated soil was greater than in noninoculated soil and correlated with the yeast population. The rate of decomposition of n-paraffins was somewhat greater than that of aromatic hydrocarbons. The rates of decomposition of various pollutants, as well as the period of effective action on the process of degradation are determined by species peculiarities of the cultures inoculated into the soil, allowing the process to be regulated by periodic introduction of populations of hydrocarbon-oxidizing microorganisms. Figures 7; references 15: 13 Russian, 2 Western.
[196-6508/12223]

UDC: 579.841.11-222.4.252.5

PARTICIPATION OF PLASMIDS IN DEGRADATION OF α -METHYLSTYRENE

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85
(manuscript received 6 Nov 84) pp 854-855

BORONIN, A. M., ANISIMOVA, L. A., GOLOVLEVA, L. A., DZHUSUPOVA, D. B. and SKRYABIN, G. K., Institute of Biochemistry and Physiology of Microorganisma, USSR Academy of Sciences, Pushchino

[Abstract] The capability of bacteria of the genus Pseudomonas to decompose many foreign compounds results partially from the presence of biodegradation plasmids. This report presents results indicating that plasmid genes are involved in the transformation of α-methylstyrene. P. putida and P. aeruginosa were used in the study. The presence of plasmid DNA was recorded and the molecular mass of the plasmids determined, all by methods described previously. Analysis of the culture fluid in which transconjugant strains were grown on α-methylstyrene showed the presence of two compounds in the mixture of benzene-dioxane-acetic acid, corresponding to the products of transformation of α-methylstyrene: acetophenone and α-methylbenzyl alcohol. It is demonstrated that the capability of P. acidovoranas to grow on α-methylstyrene results from the presence in the cells of a strain of plasmid having a molecular weight 110 and 130 MD. Figures 1; references 8: 3 Russian, 5 Western.
[196-6508/12223]

UDC: 579.841.23.017.7

INFLUENCE OF NUTRIENT MEDIUM WITH OPTIMAL NITROGEN AND PHOSPHORUS CONTENT ON BIOSYNTHESIS OF BEIJERINCKIA INDICA EXOPOLYSACCHARIDE

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 5, Sep-Oct 85
(manuscript received 30 Jan 85) pp 856-857

NAUMOV, G. N., MULTYKH, I. G. and SHAMRINA, T. P., North Caucasus Branch, All-Union Scientific Research Institute of Biosynthesis of Protein Substances, Krasnodar

[Abstract] A study was performed of the influence of various concentrations of nitrogen and phosphorus in a nutrient medium on the accumulation of exopolysaccharides by a Beijerinckia Indica culture. This producer synthesizes exopolysaccharides reminiscent in their properties of the product PS-7, the production of which is planned by the Kelco [Calco?] Company in the USA. The high capacity for swelling, great viscosity and pseudoplasticity of this biopolymer make it very interesting to study the culture. Both nitrogen and phosphorus were found to be significant factors influencing biosynthesis under the experimental conditions used. The regression factor for peptone was -71, for Na_2HPO_3 it was -34. Decreasing the content of these components in the medium thus increases the yield of polysaccharide. References 4 (Russian).
[196-6508/12223]

UDC: 579.841.31:579.252.5

ANALYSIS OF PLASMIDS IN RHIZOBIUM MELILOTI STRAINS OF VARIOUS GEOGRAPHICAL ORIGINS

Moscow MOLEKULYARNAYA GENETIKA, MIKROBIOLOGIYA I VIRUSOLOGIYA in Russian No 8, Aug 85 (manuscript received 18 Oct 84) pp 13-15

ZLOTNIKOV, K. M., RUMYANTSEVA, M. L., and ARONSHTAM, A. A., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] It is characteristic of R. meliloti that the cells contain primarily regaplasmids with molecular weight over 400 MD carrying the basic set of symbiotic genes. Many strains of R. meliloti also carry one or more additional plasmids of unknown function. This work is dedicated to an analysis of plasmids in 34 strains of R. meliloti of various geographic origins. The presence of the plasmids in the bacterial cells was determined by a modified Ekhardt method. Molecular weights of the plasmids were estimated from their electrophoretic mobility relative to plasmids of the standard strain R. leguminosarum T3. The data that are presented in tabular form are primarily important as initial materials for molecular-genetic studies of the strains used. Prospects are revealed for marking of plasmids with transposon Tn5 and a search for conjugate plasmids, allowing the influence of extra-chromosomal DNA on the effectiveness of nitrogen-fixing symbiosis of bacteria with plants to be determined. References 12: 3 Russian, 9 Western.
[195-6508/12223]

UDC: 612.112.94.014.4:579.841.32

INFLUENCE OF AGROBACTERIUM TUMEFACIENS (SMITH AND TOWN) CONN. ON FUNCTIONAL PROPERTIES OF HUMAN BLOOD LYMPHOCYTES

Moscow MOLEKULYARNAY GENETIKA, MIKROBIOLOGIYA IVIRUSOLOGIYA in Russian No 8, Aug 85 (manuscript received 28 Aug 84) pp 35-38

SLEPUKHINA, L. V., MOROZOVA, I. S., SAKHAROVA, M. N., and ZOZ, N. N., Institute of Chemical Physics, USSR Academy of Sciences, Moscow

[Abstract] Since Agrobacterium tumefaciens may be present in homoiotherms, where it interacts with various imunocompetent cell populations, it is interesting to study its influence on human lymphocytes. In this work a model of lymphoid cells was used to study the capability of Agrobacterium tumefaciens on intensity of uptake of [^{3}H]-Td in the DNA of human lymphocytes stimulated to proliferation was studied. The data obtained indicate that Agrobacterium tumefaciens added in vitro to a lymphocyte culture stimualted by PHA inhibits development of the blast-transformation reaction. The bacterium also stimulates a spontaneous human lymphocyte culture to proliferation. it apparently competes with the lymphocytes for PHA bonding. References, 8: 2 Russian, 6 Western.
[195-6508/12223

MILITARY MEDICAL CONFERENCE ON TREATING TRAUMA AND SHOCK

Moscow KRASNAYA ZVEZDA in Russian 15 Dec 85 p 4

[Text] A scientific-practical conference devoted to problems of intensive therapy was held at the Main Military Clinical Hospital imeni Burdenko. Specialists discussed questions of treating patients with acute impairments of vital functions of the body, and also the latest methods of treating blood loss, trauma and shock.

Taking part in the work of the conference were General-Lieutenant of the Medical Service Ye. Gembitskiy, chief therapist of the USSR Defense Ministry and a corresponding member of the USSR Academy of Medical Sciences, and General-Lieutenant of the Medical Service K. Lisitsyn, chief surgeon of the USSR Defense Ministry and a corresponding member of the USSR Academy of Medical Sciences.

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CSO: 1840/244

UDC 578.245:578.541:577.213.3

PRODUCTION OF MUTANT GENES OF LEUCOCYTIC ALPHA 2-INTERFERON BY LOCALIZED MUTAGENESIS

Moscow MOLEKULYARNAY GENETIKA, MIKROBIOLOGIYA IVIRUSOLOGIYA in Russian No 8, Aug 85 (manuscript received 2 Jan 85) pp 38-44

PETRENKO, V. A., SIVOLOBOVA, G. F., SEMENOVA, L. N., BOLDYREV, A. N., KARGENOV, V. A. and GUTOROV, V. V., All-Union Scientific Research Institute of Molecular Biology, Koltsovo, Novosibirsk Oblast

[Abstract] This article describes development of an effective method of producing mutant genes of leucocytic alpha 2-interferon. It is the first of a series of publications dealing with production and study of the biological properties of interferon analogs. It is proposed to obtain mutant genes, determine their structure, support the expression of the genes in bacteria and, finally, study the biological properties of the interferon analogs obtained. Localized mutagenesis of the IFM gene includes the following stages: cloning of the IFM gene in DNA of M1 3 mp8; production of double-stranded hybrid DNA complex containing the cloned IFM gene as a single-stranded DNA sector; selective modification of the single-stranded hybrid DNA sector with sodium bisulfite; repair of the single-stranded breaks in the hybrid DNA with the DNA polymerase I of E. Coli: transformation of E. Coli JM103 cells with the double-stranded circular DNA containing the modified IFM gene. Figures 4; references 14: 6 Russian, 8 Western. [195-6508/12223]

UDC 636.5.082.474

EFFECTS OF LASER IRRADIATION OF CHICKEN EGGS ON EMBRYOGENESIS AND CHICK BIOCHEMISTRY

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 10, Oct 85 (manuscript received 26 Feb 85) pp 88-90

LIVAK, I. I. and SKVARUK, V. S., Ukrainian Scientific Research Institute of Farm Animal Physiology and Biochemistry, Lvov

[Abstract] The eggs of Khayseks [sic] white chickens were employed in a study to determine the effects of irradiation with polarized monochromatic red helium-neon laser light (632.8 nm, 25 mW, 30 sec exposure) on embryogenesis and tissue biochemistry. The data showed that maximal stimulatory effects on embryogenesis were obtained with irradiation immediately before incubation and on the 7th day of embryogenesis. The tissues of such chicks exhibited more efficient energy metabolism in the utilization of the nutrient resources of the yolk sac. Concomitantly, the chicks produced in irradiated eggs showed greater viability. References 9: 8 Russian, 1 Western.
[1010-12172/12223]

UDC 617.713-001,4:615.847.8

PERMANENT MAGNETIC FIELD TREATMENT OF NONPENETRATING CORNEAL INJURIES AT OIL DRILLING SITE MEDICAL AID STATIONS IN UDMURT ASSR

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 7, 1985
(manuscript received 5 Nov 84) pp 442-443

ZAYKOVA, M. V., professor, GORKUNOV, E. S., candidate of physico-mathematical sciences, LIYASKIN, M. I., OSIPOV, N. A., KOSHEVOY, V. P., VLASOVA, Ye. F., physicians, and SOLOVYEV, A. A., docent, Chair of Eye Diseases, Ustinovo Medical Institute; "udmurtneft" Medical Aid Station

[Abstract] Therapeutic trials were conducted with permanent magnetic field magnetotherapy in the management of nonpenetrating corneal injuries. The low intensity fields (10 mTesla) were applied to closed eyelids of 100 workers, 20-30 years of age, injured at oil drilling sites in Udmurtia, with another 100 workers treated in the conventional manner without adjunct magnetotherapy to provide a control group. Treatment consisted of 3-20 half-hour sessions following foreign body removal. In the experimental group 98% of the patients showed recovery of 0.9-1.0 visual acuity, with superficial traumatic keratitis evident in only 2% of the subjects. Full recovery of visual acuity was obtained in only 89% of the control group, with 11% of the patients in that group presenting with traumatic keratitis. In addition, discharge time for the former group was 2.5 days on the average, and 4.5 days for the control group. The severity of complications in the magnetotherapy group was also less pronounced than in the control cohort.
[206-12172/12223]

KATREKS--A MEDICINE DERIVED FROM SHARK ENZYMES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Nov 85 p 4

[Article by Shubladze, S. [Tbilisi]]

[Excerpt] At the request of scientists, Georgian fishermen have begin the commercial catch of the Black Sea shark katran, from which a medicinal preparation is obtained.

The Black Sea shark katran is the most ancient of its kin; its pedigree goes back three million years. What is interesting is that the species has not undergone any great changes, even up to our time. To have endured, the organism of sharks must possess an enviable resistance to changes in its environment, even cataclysmic ones. It is known that sharks did not have any reactions even to the heightened radiation that was in the vicinity of Bikini Atoll in the Pacific, where the USA conducted tests of atomic bombs. They appeared to be amazingly resistant to radiation. These unique biological qualities led scientists to think that the bodies of sharks must possess special active enzymes and other substances that permit them to survive in the most unfavorable conditions.

After two years of studies in Poti, of the Black Sea shark, an extract of biologically-active enzymes of the katran was obtained. Experiments with animals showed that the preparation is not toxic, that it stimulates an animal's defense system, and that it has a positive effect in certain chronic inflammations. But how would the extract affect humans? To answer this question, Candidate of Biological Sciences A. Gachechiladze began testing the new preparation first of all on himself.

When the research cycle was completed, testing of "Katreks" began at the Kiev Institute of Experimental and Clinical Surgery, the Ukrainian Academy of Sciences' Institute of Problems of Oncology, and a number of other scientific research institutes of the country. After comprehensive testing of the new biologically active preparation, scientists have acknowledge its promise.

Specialists note that the new medicine "Katreks", in addition to being effective in treating chronic inflammations and having an overall stimulating effect on the body, can be used on wounds that heal with

difficulty; it heightens the resistance of cells to the toxic effects of harmful substances, and restores normal blood composition. Its production has begun at one of the republic's biological enterprises, and an author's certificate of invention has been awarded to its developer, A. Gachechiladze, director of the scientific research base for the search for biologically active substances from marine flora and fauna.

The work of the scientists is continuing. A new laboratory has been created. A new vessel of the "Tropik" type has appeared in the Poti seaport. This is the first ship in our country to be converted into a floating research base for the search for biologically-active substances.

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ACTION OF ANTIFEIN DERIVATIVE--ETHYMISOLE--ON EXPERIMENTAL LEVELS OF ANTIBODIES

Moscow IMMUNOLOGIYA in Russian No 4, Jul-Aug 85 (manuscript received 8 Aug 84) pp 82-83

BOGDANOVA, M. A., ZUBZHITSKIY, Yu. N., LOSEV, N. A., BORODKIN, Yu. S. and SOFRONOV, B. N., Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] Ethymisole (bismethylamide-1-ethylimidazole-4, 5-dicarboxylic acid), a derivative of antifein, is an active stimulator of neuro-psychological memory with a wide spectrum of pharmacological activity. Its effect on the dynamics of immune processes was investigated on white mice. It was shown that this agent stimulated the primary immune response as well as immunological memory (late response) in respect to sheep erythrocyte antigens and anti-influenze vaccine. References 10 (Russian).
[229-7813/12223]

UDC 633.511:575.24.928.2

COMPARATIVE STUDY OF CYTOGENETIC CONSEQUENCES RESULTING FROM DEFOLIANT USE ON COTTON

Tashkent UZBEKSKOY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 85 (manuscript received 25 Mar 84) pp 46-49

VESMANOVA, O. Ya., OTAKHANOV, I. O. and ERGASHEV, A. K., Institute of Experimental Biology of Plants, UzSSR Academy of Sciences

[Abstract] In connection with the wide use of pesticides and defoliants on cotton fields, their effect on the inheritance system of living organisms was investigated. The concerns of the geneticists were well grounded in that indiscriminate use of chemicals may lead to genetic shifts in carefully developed agricultural brands. Cytogenetic action of butylphos (I), mangesium chlorate (II) and butyl captax (III) defoliants was studied on cotton plants of the brand G. Barbadense L. in laboratory and field experiments. All of them showed strong cytogenetic activity, significantly increasing the percentage of aberrant cells; the highest percentage of abernation was observed when the cotton seeds were treated with a mixture of II and III. In field spraying these defoliants also showed cytogenetic activity but not as strong as in the seed treatment test. All defoliants caused single and multiple deletions and microfragmentation. The most mutagenic agent was I,--III exhibited the strongest cytogenic effect. References 8 (Russian).
[205-7813/12223]

USE OF TRICYCLIC ANTIDEPRESSANTS IN TREATMENT OF HEART DISEASE

Moscow MEDITSINSKAYA GAZETA in Russian 20 Nov 85 p 3

Karkishchenko, N., Professor, head of the Rostov Medical Institute's chair of clinical pharmacology; Tarakanov, A., candidate of medical sciences [Rostov-on-Don]

[Abstract] The authors share experience with the use of psychotropic agents, particularly tricyclic antidepressants, for postoperative anesthesia and in the treatment of various forms of ischemic heart disease. Information is provided on the therapeutic effects and advantages of tricyclic antidepressants in this connection, procedures for their administration, and circumstances in which their use is contraindicated. Particular attention is devoted to methods employing the antidepressant "melipramin" (imizin) in combination with anesthetics, for termination of prolonged resistant pain syndrome in cases of acute myocardial infarction. These methods have been proposed in the Rostov Medical Institute's chair of clinical pharmacology.

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ARENARIN: NOVEL OPHTHALMIC ANTIMICROBIAL

Odessa OFTALMOLOGICHESKIY ZHURNAL in Russian No 7, 1985
(manuscript received 12 Apr 85) p 444

SMIRNOV, V. V., academician, Ukrainian SSR Academy of Sciences, and
NEGRASH, A. K., senior scientist, Institute of Microbiology and Virology,
Ukrainian SSR Academy of Sciences, Kiev

[Abstract] In 1985 Arenarin, a novel ophthalmic antimicrobial developed at the Institute of Microbiology and Virology of the UkSSR Academy of Sciences, will be placed on the market by the "Tatkhimfarmpreparaty" Pharmaceutical Chemistry Association in Kazan. The drug will be formulated as a 1% paste dispensed from 10 g tubes, with a shelflife of 2 years. The active component, arenarin, is obtained from the flowers of the immortelle (strawflower, Helichrysum arenarium). It is a complex of bioactive agents with marked antibacterial activity against the Gram positives, especially staphylococci and streptococci, including antibiotic resistant strains. Trials at several clinical centers in the USSR have shown it to be, in addition, a low-toxicity ointment with anti-inflammatory activity and enhancement of nonspecific immunity. [206-12172/12223]

UDC 612.46:612.014.43

CHANGES IN BASIC KIDNEY FUNCTIONS UNDER CONDITIONS OF 30-DAY HYPOKINESIA

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 85 (manuscript received 2 Jan 85) pp 20-23

UMAROVA, M., Institute of Physiology, UzSSR Academy of Sciences

[Abstract] Principal indicators of kidney functions were studied in dogs during development of hypokinesia: kidney plasma flow, glomerular filtration and cannicular reabsorption, diuresis and the content of mineral salts in urine. Considerable changes in water and salt excretion functions were noted in early periods of hypokinesia: decreased plasma flow, glomerular filtration and the diuresis. The cannicular reabsorption intensified and the concentration of Na in urine decreased while that of potassium increased. At a later period, the plasma flow increased along with glomerular filtration, while liquid reabsorption decreased leading to an overall loss of liquid. Thus, it was shown that restraint in mobility led to alterations in neuroendocrine activity. Figures 1; references 20: 18 Russian, 2 Western.
[205-7813/12223]

UDC 612.014.461.3

CONTENT OF TOTAL, EXTRA- AND INTRA-CELLULAR WATER IN BODY DURING MUSCULAR EXERTION OF DOGS ADAPTED TO HIGH TEMPERATURES

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 5, Sep-Oct 85 (manuscript received 2 Jan 85) pp 23-25

TURSUNOV, Z. T. and NAGIBINA, T. V., Institute of Physiology, UzSSR Academy of Sciences

[Abstract] Changes in the volume relationship between extra- and intra-cellular liquid in dog body during physical exercise was studied after adaptation of the test animals to elevated temperatures (38-42°C). It was shown that repeated exposure to high temperatures led to adaptive redistribution of the liquids in the body serving as a thermoregulator (increased volume of extracellular liquid and lowered levels of general and intracellular water). Daily exposures lasting 60 minutes to high temperatures led to more effective adaptation than short, 30 min exposures. Animals in the 60 min daily exposure groups tolerated well the physical demands placed on them. References: 6 (Russian).
[205-7813/12223]

UDC: 612.821.84

BINOCULAR RIVALRY IN MONOCULAR OBSERVATION OF A HOMOGENEOUS FIELD AND STABILIZED IMAGES

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85
(manuscript received 15 Feb 84) pp 360-367

ROZHKOVA, G. I., NIKOLAYEV, P. P. and DIMENTMAN, A. M., (deceased),
Institute of Information Transmission Problems, Ukrainian SSR Academy of Sciences, Moscow

[Abstract] The purpose of this work was to determine the role of binocular rivalry in monocular perception of a homogeneous and unlimited light field and stabilized images. Experiments on large numbers of subjects with normal vision were used to investigate the general peculiarities of monocular and binocular perception of homogeneous light fields. Experiments on subjects with binocular vision defects and on eye clinic patients were used to estimate the influence of various disorders on perception of the fields. Finally, several subjects were used in a test comparing the peculiarities of monocular perception of a homogeneous light field and images stabilized on the retina with suction cups. It was found that the visual sensations of monocular and binocular perception of the homogeneous light field differed significantly. None of the subjects observed significant changes in visible brightness when binocular perception was used, whereas episodic darkening of the entire field or its nasal areas was observed in monocular perception. Numbers of darkening events, size of darkened area and degree of darkness differed greatly among subjects. The number of darkenings was relatively stable for each individual subject. In some subjects, monocular perception was not complicated by binocular rivalry. These subjects should be used in studies of visual perception disorders resulting from stabilization per se. Figures 6, references 12: 2 Russian, 10 Western.
[096-6508/12223]

UDC: 612.858+612.825.55

SUBJECTIVE ESTIMATES OF RATE OF APPROACH OF SOUND SOURCE

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85
(manuscript received 28 Nov 83) pp 368-373

KOZHEVNIKOVA, Ye. V., Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad

[Abstract] A study was made to determine the accuracy with which a human can subjectively estimate the rate of approach of a sound source. Signals used were sequences of monopolar rectangular pulses 0.5 ms in length, amplitude increasing in proportion to the square of time. The repetititon frequency of the pulses was 20, 50 or 100 per second. Pairs of signals were presented, a standard with known speed and stimulus with another speed of approach, defined as final amplitude minus initial amplitude divided by time in dB/s. Subjects were to tell which signals seemed to be moving at the greater speed. It was found that subjects could distinguish the signals on the basis of apparent rate of approach alone, although when other differences such as duration or amplitude were present the subject preferred to use them. Differential thresholds of rate of approach were determined. As the rate of change of ampliitude increased from 20 to 30 dB/s. The relative differential thresholds were practically independent of apparent rate of approach, remaining at 0.2-0.3. Figures 3; references 10: 5 Russian, 5 Western.
[096/6508/12223]

UDC: 612.85:414.41

AVERAGE SPECTRUM AND IDENTIFICATION OF VOWEL-LIKE STIMULI

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85
(manuscript received 10 Apr 84) pp 374-379

MALINNIKOVA, T. G. and CHISTOVICH, L. A., Institute of Physiology iemni I. P. Pavlov, USSR Academy of Sciences, Leningrad

[Abstract] Four test subjects were used in experiments involving monaural presentation of stimuli synthesized by an M-4030 computer and recorded on magnetic tape through a 12-bit digital-analog converter and low-pass filter with cutoff frequency 10 KHz. Each stimulus was a sequence of 8 alternating single-formant pulses and 2-formant pulses with repetition period 20 ms. Results of identification of two groups of stimuli in which the same changes in average spectrum were created--by changing the relationship of amplitudes of the formants in the 2-formant stimulus or changing the amplituees between alternating 1- and 2-formant impulses--were compared in order to test the average spectrum hypothesis. If the hypothesis were correct, one would expect a change in the phonetic quality in the latter case. No such change was detected, indicating that only the form of the spectral configuration of sequential signals, their responses in the auditory dynamic spectrum, are important in the identification of stimuli. The absolute intensities of pulses are insignificant. This indicates that during the time of an unsteady vowel the spectral configurations are classified, after which the results of the classification are accumulated. Figures 4; references 4 (Russian)
[096-6508/12223]

UDC: 612.85:414.41

AUDITORY PARAMETERS OF ANTERIOR VOWELS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85
(manuscript received 7 Feb 84) pp 380-385

ZHUKOV, S. Ya. and CHISTOVICH, L. A., Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad

[Abstract] Experiments are described which were intended to test the hypothesis that in balancing a two-formant test stimulus with [i]-shaped two-formant standard, test subjects attempt to retain a constant ratio of F2 and F1 or distance between them on the auditory frequency scale. The experimenter set the F1 test stimulus. The test subject was to control the frequency of the second formant to achieve the maximum phonetic similarity of the signal with the vowel standard. The hypothesis that the ratio of frequencies of the first and second formants or the distance between them on the auditory frequency scale act as characteristics used by subject or identifying anterior vowels was not confirmed. The presence of a horizontal sector in the curve of variation of F2 as a function of F1 indicated that test subjects 'know' the absolute frequency position of the second formant in stimuli with various spectra. However, the data obtained indicated that changes in identification caused by increasing F2 can be compensated by simultaneously increasing F1. This means that differences in anterior vowels are based on the frequencies of both formants.
Figures 3; references 16: 4 Russian, 12 Western.
[096-6508/12223]

UDC: 612.821.8

SPACE-TIME DISTRIBUTION OF EEG ACTIVATION DURING VERBAL-LOGICAL AND VISUAL-IMAGE ACTIVITY

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85 (manuscript received 30 May 83) pp 436-442

ORBACHEVSKAYA, G. N. and SERBINENKO, M. V., Institute of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow

[Abstract] The task of this study was to determine the nature of participation of each of the lateralized systems, verbal-logical and pattern, in interhemisphere EEG asymmetry in various stages of the process of reaching a result and in various areas with different functional specializations. Tasks included oral calculation, tasks selected, based on aptitudes of the individuals, to be of approximately equal difficulty. Four EEG sectors were recorded: during quiet attentiveness, when ready, when listening to verbal instructions, and when performing the task. In each stage, six to fifteen five-second EEG sectors were averaged. The asymmetry coefficient of d activity and reactivity coefficient were calculated. In the state of quiet attentiveness, asymmetry between hemispheres was observed in the d activity of the subjects, particularly in the temporal areas. No asymmetry was observed in the frontal areas. During performances of tasks, new d activity asymmetry develops including individual areas of the left and right hemispheres in various stages of task performance. Psychophysiological analysis of EEG activation in response to performance of test assignments provides a basis for distinguishing the activity of the verbal-logical and visual-image systems of the brain. Figures 3; references 18: 16 Russian, 2 Western. [096-6508/12223]

UDC: 612.821.33:572.02

ESTIMATE OF EMOTIONAL STRESS DURING WORKING ACTIVITY BASED ON SYSTEMS ANALYSIS OF SKIN-GALVANIC REACTION

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85 (manuscript received 4 Apr 83) pp 463-469

RAKOV, G. K. and FADEYEV, Yu. A., Institute of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow

[Abstract] The major task of this work was to determine emotiogenic factors of labor and the nature of their relationship with the emotional reactions of female electronics-industry workers during assembly and subsequent testing of the electronic-optical system of color kinescopes. Twenty practically-healthy female workers 18 to 40 years of age with at least one year experience were studied during assembly of electronic equipment. Significant differences were found between three working stages: pressing in of subassemblies, testing of the capacitance of electron guns and attachment of cathods holders. The skin-galvanic reaction was found to be an adequate indicator of emotional stress during working activity. The nature of development and number of responses varied among individuals. Systems analysis of operations or pressing in assemblies in correlation with development of skin-galvanic responses revealed emotiogenic stages of activity. Figures 3; references 17 (Russian).
[096-6508/12223]

UDC: 612.741.1

INFLUENCE OF COMPLEXITY OF CONTROL TASK ON LEVEL OF ACTIVATION OF OPERATORS PHYSIOLOGICAL FUNCTIONS WHEN WORKING WITH WAITING

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85
(manuscript received 1 Oct 84) pp 504-510

GRITSEVSKIY, M. A. and ZAYTSEVA, Zh. I., Scientific Research Institute of Labor Hygiene and Occupational Diseases, RSFSR Ministry of Health, Gorkiy

[Abstract] A series of experiments was conducted to answer two questions: 1) do model experiments reveal differences in the functional status in comparing operator's work with various degrees of complexity; and 2) are these changes similar in nature to those manifestations of differing intensity discovered under production conditions. Programs with various specific shares of single- and multiple-movement control tasks were used to model operators work of varying degrees of complexity. Five students 19 to 24 years of age were used in the study. During the experiments, reaction time, EEG, skin-galvanic reaction and pulse rate were continually recorded. Differences in bioenergetic activity of the cerebral cortex and differences in autonomic activity and regulation were observed, indicating that waiting for signals requiring complex processing was accompanied by higher mobilization of preparedness of the operator. Decreases in attention level were observed at the beginning of the day and toward the end of long days. The need to maintain the level of preparedness for action with decreasing physiological activity of the body is a unique motivational conflict, demanding new levels of regulation. Figures 4; references 22 (Russian). [096-6508/12223]

UDC: 612.82

RELATIONSHIP OF PSYCHODYNAMICS OF VERBAL MEMORY FUNCTION WITH FORCE AND LABILITY OF NERVOUS PROCESSES

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85
(manuscript received 9 Jan 84) pp 523-525

STRELKOV, V. B. and AMINEV, G. A., Ufa Institute of Aviation; Bashkir State University, Ufa

[Abstract] The purpose of this work was to study differences in dynamics of reproduction of words presented for long periods of time among individuals and establish their variation as a function of nervous system type. Verbal memory was studied, since it is the basis of many types of verbal activity. Some twenty test subjects 18 to 24 years of age listened to recordings of 200 different sequences of 1 and 2 syllable emotionally neutral words at intervals of 20 seconds. All words had approximately the same frequency of occurrence in natural speech. Each series consisted of ten words, pronounced at intervals of one second. After the 'repeat' signal was given, the test subjects spoke the lists of words in arbitrary sequence, indicating when they were finished. Two series of experiments were performed with a time separation of one to one and one half months. Reliable peaks were found in the spectra of fluctuations of volumes of storage of words, distributed in two bands: high frequency waves with periods of 1 to 20 minutes and lower frequency waves with periods of over 25 minutes. High positive correlation (r=0.51) of 1-1.5 minute spectral peaks in the volume of storage with lability of nervous processes was observed. For the 3-5 minute rhythm this relationship was negative (r=0.7). The 1-1.5 minute rhythm predominated in labile subjects, the 3-5 minute rhythm in inert subjects. The slow-wave portion of the spectrum of fluctuation of memory volume, with period over 25 minutes, was stronger during the first study in persons with weak excitation processes, in the second study--stronger in persons with strong excitation processes. References 9 (Russian). [096-6508/12223]

UDC: 612.84

PSYCHOPHYSICAL CHARACTERISTICS OF STEREO PERCEPTION OF OBJECTS ARBITRARILY LOCATED IN SPACE

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 11, No 3, May-Jun 85 (manuscript received 2 Nov 83) pp 525-528

KROL, V. M. and TENENGOLTS, L. I., Institute of Control Problems (Automation and Telemechanics), Moscow

[Abstract] Specially synthesized test stereo pairs generated by computer and containing no monocular keys to depth perception were used in these studies. When examined monocularly, the stereograms appeared as 2-gradation black-white textured patterns. The stereo pairs were presented in a specially designed mirror stereoscope allowing the relaxation time to be changed during recognition of figures of various tyeps. Quantitative study of the characteristics of perception of point and line stereo pairs showed that for point fitures increasing the angle of inclination greatly reduced depth perception. For line stereo pairs reaction time changed very little with changes in inclination. The results indicate that the mechanism based on point by point comparison of masses of elements, as in perception of point patterns, is actually significant in the analysis of parallel frontal images. It is hypothesized that in the recognition of images the brain separates the presented image into horizontal strips, beginning at the top edge of the image. The brain expects that corresponding images will occur within the same horizontal strip in each eye. The experiments showed that vertical shifting is a critical parameter in stereo vision. The results thus agree with the strip hypothesis. Figures 3; references 6: 4 Russian, 2 Western. [096-6508/12223]

STATE PRIZE RECIPIENTS FOR BRAIN PHYSIOLOGY RESEARCH

Leningrad LENINGRADSKAYA PRAVDA in Russian 1 Dec 85 p 1

[Abstract] Photographs are given of seven Leningrad residents who received the 1985 USSR State Prize for basic research on the physiology of the human brain. All, affiliated with the USSR Academy of Medical Sciences' Institute of Experimental Medicine, they are: Academician Natal'ya Petrovna Bekhtereva, director of the institute and the project director; Doctor of Biological Sciences Valentina Aleksandrovna Ilyukhina and Doctor of Medical Sciences Vladimir Mikhaylovich Smirnov, heads of laboratories; and four senior science associates--doctors of biological sciences Yuriy L'vovich Gogolitsyn and Yuriy Dmitriyevich Kropotov, Doctor of Medical Sciences Lilyara Kurbanovna Kambarova, and Candidate of Medical Sciences Andrey Dmitriyevich Anichkov.

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CSO; 1840/243

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INFLUENCE OF NORADRENALINE ON INITIAL STAGE OF POLYAMINE SYNTHESIS IN RAT LIVER

Kiev KODLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 8, Aug 85 (manuscript received 12 Apr 85) pp 71-74

MIKHAYLOVSKIY, V. O. and GULYY, M. F., academician, UkSSR Academy of Sciences, Institute of Biochemistry, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] The ornithine decarboxylase reaction is the first and limiting link in the chain of synthesis of polyamines in mammals. Activation of ornithine decarboxylase (ODC) in the liver results from the effect of various anabolic or proliferative stimuli, increasing the total synthesis of protein and nucleic acids. Cases of activation of ODC in vivo can be considered a result of the nonspecific stress reaction of the organism. The earliest and most characteristic manifestation of stress is increased production and excretion into the blood stream of catecholamines, particularly noradrenaline. Injection of noradrenaline to intact animals can reproduce metabolic changes characteristic of stress. This article studies the influence of exogenous noradrenaline on ornithine decarboxylase reaction in the liver of rats. ODC stimulation of the liver is an early metabolic effect of noradrenaline, the appearance of which requires expression of the corresponding genome and includes synthesis of enzyme protein de novo. The results obtained indicate the possibility of inducing the key enzyme of polyamine synthesis independent of the general level of anabolic or proliferative activity of the tissue. Induction of ODC is inherent in any stress effect and is a universal factor in adaptation to high functional loads. Figures 2; references 11: 5 Russian, 6 Western.
[070-6508/12223]

UDC 616-091:378.661

BETTER SUPPLY AND CERTIFICATION OF PATHOLOGIC-ANATOMISTS

Moscow ARKHIV PATOLOGII in Russian Vol 47, No 11, Nov 85 pp 68-70

[Article by A. M. Vikhert and I. A. Kazantseva, VKNTs [expansion unknown] Institute of Human Morphology, USSR AMS: "Urgent Issues of Preparation and Certification of Pathologic-anatomist Physicians"]

[Text] The striving of modern clinical medicine toward the maximum objectification of evaluating the material substrate of disease has expanded significantly the diagnostic use of lifelong morphological studies. This has been facilitated by the possibilities of surgery and endoscopic technology, which are growing with every year and which permit obtaining biopsy samples from practically any organ. At present, the biopsy sample has become one of the basic objects of study for pathologic-anatomists. In many cases it is precisely with the aid of a biopsy that the character of a disease is defined more accurately, which gives clinicians the opportunity to evaluate the disease course, its prognosis, and the efficacy of the applied therapy. The diagnostic biopsy has acquired special significance in oncology, where the amount of surgical intervention and the prescription for the patient of radiation or drug treatment depend on the correctness and completeness of the conclusion of patholic-anatomists.

Modern medicine is making higher demands on the dissection part of the job of a pathologic-anatomist. In order for an autopsy to be of benefit to the clinical sector and to the dissector, a high degree of professionalism and knowledge in adjacent disciplines such as biochemistry, cytology, immunology, reanimatology, and others is necessary, without which it is difficult to gain a full knowledge of the features of the thanatogenesis and to define the character of the pathological process from the viewpoint of its etiology, pathogeny, and pathomorphy.

All that has been said here attests to the fact that the modern pathologic-anatomist should be a highly qualified specialist. Meanwhile, in recent years, the issue regarding the providing of service by qualified personnel has arisen sharply. This has been brought about by several causes, among which the objective factors should be singled out: a significant general increase in the volume of

pathologic-anatomical examinations, made possible by an expansion of the network of therapeutic-prophylactic institutions, and a sharp increase in the number of biopsic examinations. However, there is no doubt that the basic cause for the situation created lies in an obviously inadequate influx of new personnel into the specialty, which cannot be explained merely by references to a "non-prestigious" character of the profession. Data about the composition, according to age, of pathologic-anatomists in 45 territories of the RSFSR, indicates that persons 30 years or under comprise 0.9 percent in all, and persons from 30 to 35 comprise 18.9 percent of all working pathologic-anatomists.

Unfortunately, official statistics cannot give a complete picture of the deficit of pathologic-anatomic personnel due to the fact that in many union republics and RSFSR oblasts an overwhelming majority of the assignments in pathologic-anatomical departments of hospitals are occupied by persons holding more than one position--physicians in other specialties. For example, in the Rovno Oblast, of 24 established medical slots in pathologic-anatomical departments, 23(!) are held by physicians of other specialities. In Nikolaevskaya Oblast, 50 percent of pathologic-anatomist slots are occupied by physicians of other specialties; in Georgia (not counting Tbilisi), of 31 established pathologic-anatomical positions, six in all are manned by specialists, and eight are held by non-specialists who hold more than one position. Unfortunately, the enumeration of examples can be continued by including in it the dissectors of several clinical hospitals in Moscow and Leningrad. It should be especially emphasized that the widespread growth in pathologic-anatomical departments of pluralism by physicians in other specialties (mainly by experts in forensic medicine) leads to a sharp deterioration in the quality of pathologic-anatomical examinations. Physician-pluralists at best can conduct autopsies; a subsequent microscopic examination of autopsy material is not always conducted, and the character of an illness often thus remains undefined, since the pathologic-anatomical diagnosis is formally "pushed aside" underneath the clinical diagnosis. Naturally, such work brings no good at all to public health care. Such pluralism brings special harm to the biopsy portion of the work. In local areas, even with presence of laboratory assistant-histologists in the departments, examinations of biopsy samples are not conducted by the pluralists, materials are sent away to oblast or republic centers, and time periods for examinations are intolerably lengthened (up to a month and longer).

A sharp decline in the level of qualifications of physicians in pathologic-anatomical departments, including those working within the network of oncological dispensaries, has grown out of the fact that in the nation, during the course of many years, the training of pathologic-anatomists has been accomplished only in the departments of medical VUZ's, and in insufficient numbers there, while in hospitals, in essence, no training has been conducted. In a series of cases the most flagrant errors are encountered, allowed by pathologic-anatomists in the diagnoses of oncological and chronic inflammatory diseases.

According to data from the department of pathological anatomy of human tumors of VONTs [expansion unknown] of the USSR AMS for 1984, flagrant errors in diagnoses comprises approximately 20 percent of all the conclusions of pathomorphologists with whom patients consulted for treatment in this institution, including hypodiagnoses of malignant neoplasms, which took place in three percent of the cases, hyperdiagnoses in 10 percent, and incorrect conclusions about the histogenesis of new growths in seven percent; in some cases it was not possible to establish a diagnosis because of the low quality of the histological preparations sent (although the patients were sent with definite patho-histological conclusions).

The facts cited bear witness to the imperative necessity of taking extraordinary measures for improving the training of young pathologic-anatomists, first and foremost in the area of the biopsic diagnosis of oncological diseases.

An important place in the training of a pathologic-anatomist should be taken by a one-year internship in pathological anatomy, which, by order of the USSR Ministry of Health, May 3, 1983, has been authorized for all medical institutes. However, one internship cannot solve the problems of personnel training. It is perfectly obvious that one year is insufficient even for an elementary mastery of the work skills, to say nothing of establishing a young physician in a specialty. Regrettably it must be stated that the majority of those who have completed an internship in pathological anatomy, having been exposed to the difficulties of the pathologic-anatomist profession, prefer to move to work in a clinical specialty or to forensic medicine. Besides, as experience shows, many issues of internship organization have not yet been worked out. This concerns first of all a program for interns, which should be reviewed while aiming at the maximum response to the needs of the clinic (at the present time it is impossible, through the existing program. to train a pathologic-anatomist for practical public health care); it also concerns the central departments for the internship process. These must be only major centralized pathologic-anatomical departments, manned by qualified physicians. It would be quite advisable for those finishing the internship to be sent, as well, to work at the major centralized departments for a period of three years, and only after this, in case of need, to be able to work independently in municipal and central rayon hospitals. Success in solving the personnel issue of pathologic-anatomical service can be provided only in the case where a solid base is created in the form of a well thought-out and organized system of training for the pathologic-anatomist physician, which stipulates subsequent study in a subresidency, an internship, and a clinical residency for a period of four years. Only such a system of study can be considered equivalent to the program of the VOZ [World Health Organization] for training the "European pathologist." The 4-year training program, including a mastery in stages of the methods of dissectional and biopsic examinations, a program in increasing complexity, which gives a young physician (after passing the appropriate exam) the right to independently offer conclusions, should be developed specially.

In the optimal version, complexes of academic departments of pathological anatomy and major modern centralized pathologic-anatomical clinic departments should become the educational-production base for the training of pathologic-anatomist doctors. Already, there are examples of such fruitful collaboration (Riga, Lvov, Kharkov, Nalchik, Tashkent, Tbilisi, and others). In spite of this, special consideration should be given the acquisition of clinical work skills by young specialists (the participation of the pathologic-anatomist in endoscopic examinations, in the taking of intrasurgical biopsy samples, in consultations of clinical physicians during discussions of cases that are complex in a diagnostic respect, and preparation and participation in clinical-anatomical conferences).

Unfortunately, far from all academic departments of pathological anatomy show the proper activity in interesting the graduates of medical institutes in the pathologic-anatomist specialty. Frequently the work of such departments is practically fully isolated from the major centralized pathologic-anatomical departments of clinical hospitals headed by experienced specialists who are held in authority among the medical society of the city. Naturally, while learning in such academic departments, students cannot form the correct conception of the importance of pathological anatomy for the clinic and the possibilities of the lifelong diagnosis of diseases of pathologic-anatomists. It is apparent that the situation created, is to a large extent, the result of the fact that over a long period of time academic departments of pathological anatomy were included as a part of theoretical departments. This adversely affected the influx of young people into our specialty. One wants to hope that the issuance of the order by the USSR Ministry of Health for placing academic departments of pathological anatomy in the category of clinical departments will improve the situation created.

We believe that raising the requirements for the certification of pathologic-anatomists should become one of the conditions for their professional improvement. In certifying pathologic-anatomists, it is expedient to take into account and evaluate, by means of examination, the concrete knowledge of the specialist, including knowledge of the questions of biopsic diagnosis. It would be correct to award the first category of qualification only to persons who have passed a diagnostic examination on sufficiently difficult biopsies. This demands carrying out a series of measures: a definite reorganization, with an increase in the quota of biopsy series, of the work of the pathological anatomy departments of institutes for the advanced training of physicians, the organization of short-term courses of specialization in local bases, in particular, in the NII [Scientific Research Institute] of oncology and in major oncological dispensaries.

Thus, beginning in 1986, the department of pathological anatomy of human tumors of the USSR VONTs [expansion unknown] AMS, together with the central pathologic-anatomical laboratory of the institute

of human morphology of the USSR AMN, are planning the organization of 2-week courses of specialization for groups of pathologic-anatomists of oncological preventive dispensaries on the more practical and complex divisions of biopsic, including endoscopic, diagnosis. Leading specialists in oncomorphology will take part in conducting these courses.

Without a doubt, the training of personnel is an all-round matter that concerns equally both academic departments of pathologic-anatomy and scientific workers, and practical dissectors with much work experience. Without a definite enthusiasm and the aspiration to transmit their knowledge and experience, this matter cannot be successfully resolved.

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CSO: 1840/201

COMPUTERS NEEDED BY PHYSICIANS

Moscow LITERATURNAYA GAZETA in Russian 13 Nov 85 p 10

KANEP, V., LaSSR Minister of Health

[Abstract] The load of paperwork facing each physician today can be solved only by automation. The automation achieved thus far has been oriented towards administrative procedures in hospitals, in pharmacies but not at individual physicians. Last year, 92% of the Latvian population was examined prophylactically without increasing medical help; this was achieved by introducing computer technology. Physicians were equipped with computers: "Iskra 1256", "Iskra-226", "SM-3" and "SM-4". A complex program "KASMON", covering all principal diseases treated by the doctors, was written for medical examination of the population. With nursing assistance, patients filled out forms covering 67 questions and then computers provided preliminary diagnoses, after which the patients were seen by the doctor. In Latvia, there are currently 47 physicians and 138 beds for 10,000 individuals. Hospital stay exceeds that of the developed countries' stay of 7-8 days. A program was written also for analysis of bed occupancy. The problem remaining to be solved is better utilization of the hospitals during weekends. Selection and proper training for the cadres [key personnel], more strict evaluation of the academic progress of medical students, provisions for candidacy to medical school prior to admission are some of the other problems needing to be solved. Mutual exploitation and cooperation between qualified personnel at academic institutions and in industry are to be encouraged. [236-7813/12223]

CRIMINAL INDIFFERENCE TO PATIENT NEEDS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 2 Oct 85 p 4

LAYKHOV, A., Special correspondent, Novosibirsk

[Abstract] The tragic story of Nella Kuzmina, who tried in vain to get proper medical care either in the hospital or from the emergency first aid service, (Skoraya Pomoshch), is raised in an attempt to bring the guilty parties to accounting. Her parents had attempted to achieve this but were unsuccessful. They wrote a complaint letter to the source newspaper accompanied by numerous signatures of close friends verifying the sorry state of medical service, the indifference of the doctors to human misery. Several examples are listed showing both the punishment of physicians who committed errors of judgement and examples of extreme devotion of some others. However, the main theme of this report is that some vehicle should exist for evaluation of physicians performing less than adequately on their jobs. [237-7813/12223]

SAFETY PRACTISES IGNORED

Moscow LITERATURNAYA GAZETA in Russian 11 Sep 85 p 13

BORIN, A.

[Abstract] "More is better" seems to be the prevalent attitude at many enterprises, as a result of which the Soviet public often has to suffer easily avoided negative consequences. In one case, failure of a medical oxygen supply plant to monitor serial numbers on gas tanks led to the death of a patient with acute appendicitis who was administered carbon dioxide instead of oxygen. The workers at the plant, the pharmacy, and the hospital simply found it more convenient to count the number of tanks coming in and out, without bothering about the serial numbers as required by regulations. In another case, a building collapsed killing a number of people. Faulty construction 20 years previously was the fundamental cause of the collapse, but the immediate culprits were the official and engineers who ignored complaints from residents of the building about cracks in the walls, water leakage in the basement, and so forth. These are but a few examples of gross irresponsibility and negligence on the part of officials, administrators and workers concerned more with productivity and meeting set plans than with strict adherence to safety regulations. Everybody seems to agree that in principle prevention is worth more than a cure, but few seem willing to practice it.
[192-12172/12223]

CRITICISM OF MEDICAL INSTITUTE ENTRANCE EXAMS AND STUDENT GRADING

Moscow LITERATURNAYA GAZETA in Russian 18 Sep 85 p 12

VAKSBERG, A.

[Abstract] This is a follow-up of the writer's previous article "Oxygen Starvation" which elicited many letters, many of them from physicians and educators who have condemned the current practice that students at medical institutes are virtually guaranteed a diploma, regardless of academic or moral shortcomings. In addition, many have also commented that many otherwise-qualified candidates fail to get into a medical institute on a minor technicality, which does not hinder admittance of those who can afford special tutors. In short, it appears that the Soviet medical profession is preoccupied with numbers and filling plans, i.e., graduating a given number of physicians, without due consideration being accorded to medical ethics and moral suitability.
[193-12172/12223]

SOVIET HEALTH

Moscow GOLOS RODINY in Russian No 44, Oct 85 p 6

KOROBOCHKIN, N.

[Abstract] Preventive medicine centers have now been opened in all of the Soviet republics and, in conjunction with the USSR mass screening program, can already be seen to have had a profound effect on the health of the Soviet population. The Deputy Minister of the USSR Ministry of Health has pointed out that the effects are already apparent in the case of birth rate, which increased dramatically from 18.1/1000 population in 1977 to 19.6/1000 in 1984. This was accompanied by an equally dramatic decrease in maternal and pediatric mortality figures, with the mean mortality for the USSR presently standing at 10.8/1000, a figure well below that for many capitalistic countries (West Germany - 11.7, Great Britain - 11.8, Austria - 12.0). With the liquidation of many infectious diseases, other forms of pathology have come to the fore, such as diseases of the cardiovascular system, cancer, trauma, poisonings, and respiratory disorders. As a result of the mass screening program [dispensarization], mortality from hypertension is expected to decrease by 10-15 % in the next decade in the working-age population, and the lifespan is expected to increase by 3-5 years. In some of the republics most of the population has already undergone mass screening. In Latvia, for example, approximately 90% of the population has already been examined thanks to automated laboratory technology. In other areas, mobile teams are being organized to carry out the mass screening program, which in Siberia take the form of shipboard centers that ply the major rivers and reach local settlements. In the Kanev Rayon of Karsnodar Kray, mass screening has resulted in a three-fold decrease in the loss of work days due to rhumatism, gastritis and ulcers over a three year period.
[188-12172/12223]

POLAR MEDICINE IN SIBERIA

Moscow PRAVDA in Russian 25 Nov 85 p 3

BORODIN, Yu., academician and vice-president, USSR Academy of Medical Sciences (AMS), and chairman, Presidium of the Siberian Department, USSR AMS, and MATYUKHIN, V., corresponding member, USSR AMS, and director, Institute of Physiology, Siberian Department, USSR AMS

[Abstract] Considerable progress has been made in polar medicine as practiced in Siberia, including specific studies on adaptability of the human body to cold environemnts and on creation of the field of medical climatic cartography. Equally important are measures taken to maintain public health, which include the creation of railroad medical teams which travel from location to location, fully equipped with all the necessary laboratory paraphernalia. Such arrangements make it possible to follow mobile labor teams and to provide medical care to remote settlemtnts. Despite the success with which such measures have met, in many cases they remain based on local initiative rather than receiving broad support from the RSFSR or the USSR Ministries of Health. In addition, the central authorities have not taken the necessary steps to provide the Siberian population with adequate health resorts. Additional support and understanding will also be needed for ensuring that new cities and settlements are provided with optimal conditions as regards environmental health, are that rigid measures be taken to control environmental pollution. [186-12172/12223]

REVIEW OF BOOK ON PRINCIPLES OF AVIATION PSYCHOLOGY

Moscow VOZDUSHNYY TRANSPORT in Russian 17 Dec 85 p 2

[Article by Morozov, A.]

[Excerpt] A book entitled Principles of Aviation Psychology (Osnovyy aviatsionnoy psikhologii) has just been published at the "Vozdushnyy Transport" Publishing House. The author of this book is Doctor of Medical Sciences Boris Sergeyevich Alyakrinskiy. This work has attracted attention immediately, and not without reason.

One of the tasks of aviation psychology is to substantiate interrelated principles of occupational screening, the structure of flight work, and flight capabilities which are directly connected with questions of the instruction and training of future pilots.

In the book, these questions are thoroughly analyzed, psychological features of flight duty are explained, and attention is devoted to problems of flight capabilities, occupational screening, the formation and maintenance of flight skills, the role of the personal factor in ensuring the quality of flights, the instruction and training of flight personnel, and a number of other questions with which aviation specialists must be familiar. Practical recommendations for the use of psychological data to heighten flight safety are formulated in the book.

The monograph is intended for instructors and flight personnel aviation physicians, engineers and technicians, and everyone engaged in support of air transport operations.

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PRAISE OF SOVIET AND PRE-SOVIET PHYCHOLOGY CONTRIBUTIONS TO NATIONAL DEFENSE

Moscow VOPROSY PSIKHOLOGII in Russian No 3, May-Jun 85
(manuscript received 22 Jan 85) pp 5-13

DYACHENKO, M. I., Institute of Military History, USSR Ministry of Defense, Moscow

[Abstract] The experience and history of World War II (The Great Patriotic War) demonstrated the importance of psychology, reinforced and inspired by Marxist ideology, in bringing victory to the Soviet Union over fascist Germany. The sacrifices sustained, and fortitude exhibited, by the Soviet people during that time of trial were in large part due to the proper frame of mind and the will to succeed instilled by Soviet psychologists. This came about as a result of collective self-denial of individual prerogatives in favor of a common cause, for which no sacrifice was too great. It is also to be noted that the activity of Soviet psychology in the military sphere was considerably eased by pre-revolutionary Russian military psychology, which dealt with the behavior of soldiers, mass behavior in times of stress, etc. It is also to be noted that early Russian military psychology even at that time in history was distinct from the practices in Western Europe by its humanistic approach.
References 37 (Russian).
[198-12172/12223]

PSYCHOLOGY OF REFLECTION: PROBLEMS AND RESEARCH

Moscow VOPROSY PSIKHOLOGII in Russian No 3, May-Jun 85
(manuscript received 17 Jul 84) pp 31-40

STAPANOV, S. Yu. and SEMENOV, I. N., Scientific Research Institute of General and Educational Psychology, USSR Academy of Pedagogical Sciences, Moscow

[Abstract] A cursory review and examples are provided of the current status and advances in the psychology of reflection, with the four distinct types of reflection first clearly defined by S. Yu. Stepanov et al. in 1984 [Stepanov, S. Yu., et al., Problemy Inzhenernoy Psikhologii (Problems of Engineering Psychology), Ed. 2, Leningrad, 1984, pp 127-129]. At the present time the four types of reflections are categorized as: a) cooperative, b) communicative, c) personality-related, and d) intellectual. The intellectual type demands reorganization of stereotyped decisionmaking in response to a unique and unanticipated situation, i.e., in a given situation decisionmaking requires an intellectual effort at creative thinking, since reliance on past precedent would be insufficient. A situation that, in addition, presents the challenge of contradiction with respect to past experience or specific instruction brings into play personality-bound reflection, i.e., a will and decision to actively follow a different course from that included in the instructions. Communicative reflection enters the arena when two subjects have to come to an agreement as to the course of action, and cooperative when a collective has to decide on operative behavior. References 31: 25 Russian, 6 Western.
[198-12172/12223]

APPARATUS ASSEMBLY FOR PSYCHOPHYSICAL STUDIES ON VISUAL PERCEPTION

Moscow VOPROSY PSILHOLOGII in Russian No 3, May-Jun 85
(manuscript received 28 Mar 84), pp 159-162

NAZAROV, A. I.

[Abstract] A schematic outline is presented of an apparatus assembly used for computerized study of visual perception in humans. A screen terminal is used for providing various visual stimuli, which is based on a fast phosphor (P-4). The assembly included a variety of electronic equipment commercially available in the USSR and other countries, e.g., USA, as well as apparatus designed at the Psychology Faculty of Moscow State Unviersity imeni M. V. Lomonosov. The adaptability of the assembly is indicated by the fact that the basic set-up has now been in use for 5 years at the Psychology Faculty without significant modifications. Figures 1; references 2 (Russian).
[198/12172/12223

METHOD OF CHANGES IN REVERSIBLE PATTERN MASKING AS FACTOR IN VISUAL PERCEPTION

Moscow VOPROSY PSIKHOLOGII in Russian No 3, May-Jun 85
(manuscript reveived 26 Oct 83) pp 162-164

KROL, V. M. and BONDAR, Ye. I., Institute of Control Problems, USSR Academy of Sciences, Moscow

[Abstract] Temporal characteristics of form perception were analyzed in relation to masking patterns, demonstrating that different masks exert different effects on various stages of perception. Three stages were identified in form perception using stimuli consisting of alternating bands and lines arranged in horizontal patterns, and masking patterns consisting either of random curvilinear lines alone or supplemented with solid, short, bands. The different masking patterns exerted different effects (prolongation) on the threshold times for amorphous perception, approximate classification of test pattern, and on object identification. These observations demonstrated that different masking patterns significantly affect different stages of form perception, and can be utilized in the analysis of the latter. Figures 1; references 11: 5 Russian, 6 Western.
[198-12172/12223]

RADIO- AND MAGNETOBIOLOGY PROGRAM "GENOM" AT NUCLEAR INSTITUTE

Moscow LENINSKOYE ZNAMYA in Russian 17 Nov 85 p 4

[Article by Molchanov, Ye. [Dubna]]

[Excerpt] A working conference on the GENOM program has taken place in Dubna. Physicists, engineers and radiobiologists from various research centers of the Soviet Union and other participating countries of the Joint Institute for Nuclear Research (OIYAI) discussed results of five years of work in one of the most timely directions of modern radiobiology and magnetobiology.

OIYAI's biology research sector was created in 1978. The attention of scientists who are studying problems of radiation biology already has been attracted by the results of this sector's work.

The five-year program called GENOM was adopted at OIYAI five years ago. The main task of this program has been the study of mechanisms that determine differences in the biological effectiveness of ionizing radiations with different stopping powers, as well as regularities involved in the action of magnetic fields. A unit called GENOM, which is controlled by a computer, was built at OIYAI. With this unit, living cells have been irradiated with charged particles of various energies, using the "U-200" cyclotron in the institute's Nuclear Reactions Laboratory. Magnetic-field generators and a unit which makes it possible to weaken the strength of the Earth's magnetic field by a million times have been developed for magnetobiology research. DNA molecules, bacteria, yeasts, plant cells, normal and tumor cells of animals, and nerve cells of mollusks have been objects of research.

The scientists have obtained interesting results in studying the biological action of magnetic fields. Quantitative regularities of this action were established for the first time in experiments with nerve cells. Approaches to identifying regularities of the action of geomagnetic fields on the biosphere were determined in experiments with a magnetic screen which thoroughly screened out effects of the Earth's magnetic field.

Leading scientists of Dubna have shown much interest in the work of the biology research sector. Among them are Academician A. M. Baldin, director of the High Energies Laboratory; V. P. Dzhelepov, corresponding member of the USSR Academy of Sciences and director of the Nuclear Problems Laboratory; Academician G. N. Flerov, director of the Nuclear Reactions Laboratory; and Academician I. M. Frank, director of the Neutron Physics Laboratory and a Nobel Prize laureate. They think that the work which is being done in the sector under the direction of Doctor of Physical-Mathematical Sciences V. I. Danilov and Doctor of Biological Sciences, Professor Vladimir Ivanovich Korogodin is important and very timely for OIYAI.

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UDC 633:539.163+581.1.03

UPTAKE OF SOLUBLE RADIONUCLIDES BY CROP PLANTS: LITERATURE REVIEW

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 9, Sep 85
(manuscript received 26 Feb 85) pp 4-12

KORNEYEV, N. A. and YEGOROVA, V. A., All-Union Scientific Research Institute of Agricultural Radiology, Obninsk

[Abstract] A brief review is presented of Soviet and Western literature on the uptake of soluble radionuclides by crop plants via the foliar route, with calculations to be used in estimating retention levels by the various plants. The fundamental point is made that radionuclides settling on the plants are assimilated by the plants in their totality, whereas radionuclides seeeling on the soil are subject to firm absorption to soil particles, a factor which hinders their uptake by the root systems. Foliar uptake, therefore, represents a greater human hazard as it leads to radioactive contamination of the edible parts of the crop plant in most cases. Most of the data accumulated to date deal with Sr-90 and Cs-137, with considerably less attention accorded to the problem of Ru-106, Zn-65, Co-60, Ce-144 and the transuranium elements. References 48: 21 Russian, 27 Western.
[1009-12172/12223]

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EFFECTS OF WATERMELON IRRIGATION WITH MINE WATERS ON MIGRATION OF NATURAL HEAVY RADIONUCLIDES IN PLANT-SOIL SYSTEM

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 10, Oct 85
(manuscript received 10 Oct 84) pp 62-64

MARTYUSHOV, V. V., ARKHIPOV, N. P. and FEDOROVA, T. A.

[Abstract] An evaluation was conducted of the effects of using mine water for irrigation of watermelon crops on serozem soil in Central Asia on the migration of natural heavy radionuclides in the plant-soil system. Measurement of radionuclide levels in the mine water-irrigated soils and plants demonstrated a disproportionate increase of the radionuclides in the watermelons as opposed to soil levels. The use of mine waters for irrigation resulted in a 1.3- to 4-fold increase in the radionuclides (U-238, Ra-226, Po-210, Pb-210) over the level that accumulated in watermelons irrigated with river water. Th-232 constituted an exception in that the levels did not rise significantly, while the most pronounced increase was observed with U-238. Figures 1; references 4: 3 Russian, 1 Western.
[1010-12172/12223]

UDC: 578.833.1:578.224/.226:578.74

IDENTIFICATION OF MONOCLONAL ANTIBODIES FOR E_1 PROTEIN OF VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS BLOCKING HEMAGGLUTINATION BUT NOT INFECTIOUS ACTIVITY OF VIRIONS

Moscow MOLEKULYARNAY GENETIKA, MIKROBIOLOGIYA IVIRUSOLOGIYA in Russian No 8, Aug 85 (manuscript received 24 Sep 84) pp 31-35

ZHIRNOV, O. P., BUKRINSKAYA, A. G., MELNIKOVA, Ye. E., GAIDAMOVICH, S. Ya., NOVAKHATSKY, A. S. and KUSHCH, A. A., Institute of Virology, imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] Glcoproteins E_1 and E_2 participate in penetration of the VEE virus into the cell and are the major targets in the formation of antiviral immunity in an infected organism. This work reports identification of a clone of antibodies to protein E_1 of the VEE virus neutralizing the hemagglutinating activity but not blocking the infectious activity of the virions. Monoclonal antibodies were obtained by the standard hybrid technology described by Fazekas de St Groth and Schlesinger [J. immunol. meth, v.35, p. 1-21, 1980]. The specificity of the antibodies was determined using an extract of cells infected with the VEE/230 virus by the method of imuno-precipitation. It is noted that anti E_1 antibodies such as the clone MAK 14-7 produced in this article can be widely used for type-specific diagnosis of strains of the complex VEE virus. References 35: 6 Russian, 29 Western.
[195-6508/12223]

CONFERENCE ON HUMAN FUNCTIONAL CAPABILITIES AND HEALTH FORECASTING

Moscow MEDITSINSKAYA GAZETA in Russian 6 Dec 85 p 3

[Article by Nikolayev, I.]

[Text] An All-Union conference devoted to problems of evaluating human functional capabilities and forecasting health concluded its work yesterday in Moscow.

In his speech, Ye. I. Vorobyev, corresponding member of the USSR Academy of Medical Sciences and USSR First Deputy Minister of Health, noted that medical science now faces the task of developing a scientifically substantiated system of preventive measures that will ensure the preservation and restoration of working fitness and health. This is particularly important now that general preventive medical examinations of the population are being introduced in our country.

If this task is to be accomplished successfully, quantitative and qualitative data must be available on the condition of human health, the phychophysiological and immune status of individuals, and on a number of biophysical parameters. In short, the question is one of latent, reserves and capabilities of the body, how to utilize them more fully, and forecasting of health.

Biophysicists, hygienists, toxicologists, psychologists and other specialists took part in the conference. Thoroughly examined at plenary and section meetings were methodological, clinical and psychophysiological aspects of problems under discussion, as well as effects of the environment and job-related activities on the functional state of human beings.

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ALL UNION CONFERENCE OR ADAPTATION OF ORGANISMS TO CONDITIONS OF EXTREME NORTH

Moscow ZHURNAL OBSHCHEY BIOLOGII in Russian Vol 46, No 6, Nov-Dec 85 pp 858-860

MARTIN, Yu. L., MATVEYEVA, N. V. and CHERNOV, Yu. I.

[Abstract] The All Union Conference on the Adaptation of Organisms to Conditions Prevailing in Extreme Northern Territory was held in Tallinn, 27-30 Nov 84. The following groups were among the organizers: Tallinn Botanical Orchard, ESSR Academy of Sciences; Scientific Council of USSR Academy of Sciences for the Problems of Biogeocenology and Protection of Nature; and the Institute of Evolutionary Morphology and Ecology of Animals imeni A. N. Severtsov, USSR Academy of Sciences. Adaptive processes in the Arctic could serve as a model for development of general principles of adaptive strategies. The speakers covered a wide range of topics from development of theoretical concepts to ecologic--physiological aspects of adaptation. Arctic territory was stressed as a unique natural polygon for studies of biological and ecological systems. Other topics included adaptive characteristics of various organisms under Far Northern conditions, adaptive mechanisms of aqueous organisms, mechanisms of and regularities of adaptive processes, etc. The problem topic, "adaptation routes of various organisms to extreme conditions", elicited papers on geologic-geographical aspects of plant adaptations to subarctic conditions, acclimatization to the arctic environment by organisms of various phylogenetic levels; a controversy surfaced whether the most developed or the lower phylogenetic representatives should be most successful in acclimatization aspects, etc.
[204-7813/12223]

MEETING OF MOSCOW AND MOSCOW OBLAST SCIENTIFIC SOCIETY

Leningrad VOPROSY ONKOLOGII in Russian Vol 37, No 6, Jun 85 pp 114-117

Prof DENISOV, L. Ye., chairman and SIMAKINA, Ye. P., secretary candidate of medical sciences

[Abstract] This meeting on 23 February 1984 was the 311th session of the Society. The first paper, by MOROZ, L. V. and IVANOV, A. V. on "Laser Therapy Tasks in Oncology" noted that the principal task is development of endoscopic laser therapy and endosurgery. Although already used in practice, these areas still need refinement. Recently attention was directed towards photochemical effects of laser radiation on cells and tissues, which could lead to novel photoradiation techniques for treatment of various rumors. Laser beams are being applied as post-surgical adjuvants aimed at speeding the normal healing process, as retarding agents against the spread of metastases and as activators of immunologic indices in peripheral blood. The second paper was presented by TRAPEZNIKOV, N. N., KUPIN, V. I. and KADAGIDZE, Z. G. on the topic of potentiating action of laser radiation on indices of cellular and humoral immunity. PODDUBNYY, B. K., KUVSHINOV, Yu. P. and YEFIMOV, A. N. discussed endoscopic laser therapy of postsurgical complications in oncologic patients and the final paper by L. D. ZAPLAVNOVA dealt with laser radiation use in treatment of various premalignant states in uterine cervix and vulva.
[216-7813/12223]

OXYGEN-LIBERATING MIXTURES FOR BREATHING APPARATUS

Minsk SOVETSKAYA BELORUSSIYA in Russian 10 Dec 85 p 4

[Text] Mixtures which are capable at any time of 'giving up' oxygen stored in them have been prepared at the Riga Polytechnic Institute's chair of general chemistry.

When heated, 100 grams of a substance ground into powder releases more than 40 liters of gas. This is quite enough to sustain human respiration for several hours in extreme conditions. Such a need may arise not only in medical practice but also in mines, under water, and high in the mountains.

The development of these alloys is the result of painstaking theoretical and experimental work. Their components are mixtures of salts and inorganic peroxides.

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NEW MINISTER OF MEDICAL AND MICROBIOLOGY INDUSTRY V. A. BYKOV

Moscow IZVESTIYA in Russian 2 Dec 85 p 1

[Text] The Presidium of the USSR Supreme Soviet has appointed comrade Valeriy Alekseyevich Bykov minister of the Medical and Microbiological Industry of the USSR.

Comrade V. A. Bykov was born in 1983. He is a Russian, and he has been a member of the Communist Party of the Soviet Union since 1966. He is a graduate of the Kuybyshev Industrial Institute, and he is a candidate of technical sciences.

He began his working career in 1961 as an instructor at an institute, and then he worked as a mechanic and as deputy chief mechanic of the Kirishi Oil Refining Plant. From 1971 to 1976 he was director of a biochemical plant. In 1976 he was elected first secretary of the Kirishi city committee of the Communist Party in Leningrad Oblast. In 1979 he was appointed head of the microbiological industry section in the Chemical Industry Department of the Central Committee of the Communist Party of the Soviet Union, and in 1985 he was named head of the Main Administration of the Microbiological Industry of the USSR Council of Ministers.

Valeriy Alekseyevich Bykov was elected a delegate of the 25th Congress of the Communist Party of the Soviet Union. He has been awarded the order of the Red Banner of Labor, and medals.

(A photograph of Bykov is given).

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ILLEGAL TRAFFICKING IN PHARMACEUTICAL IN TBILISI

Tbilisi ZARYA VOSTOKA in Russian 3 Sep 85

INOVELI, I.

[Abstract] Recently, in Tbilisi, Mikail Dzhanashvili was sentenced to 9 years of imprisonment and confiscation of property. Dzhanashvili, the proud owner (in his daughter's name) of a Mercedes-Benz 530 acquired through connections and bribery in Moscow, had apparently never done a lick of honest work in his life and acquired all his wealth through speculation in hard-to-come-by drugs. To be sure, he had other business interests as well, but prescription drugs in short supply were his specialty. The behavior of his daughter Nana at the trial was less than exemplary. Although a Communist Party member, she never found it in her heart to condemn her father's criminal activities, and got off with a mild reprimand from the local party organization. Perhaps her case should receive further consideration from competent party cadres.
[191-12172/12223] - END -